

CITY OF MISSOULA

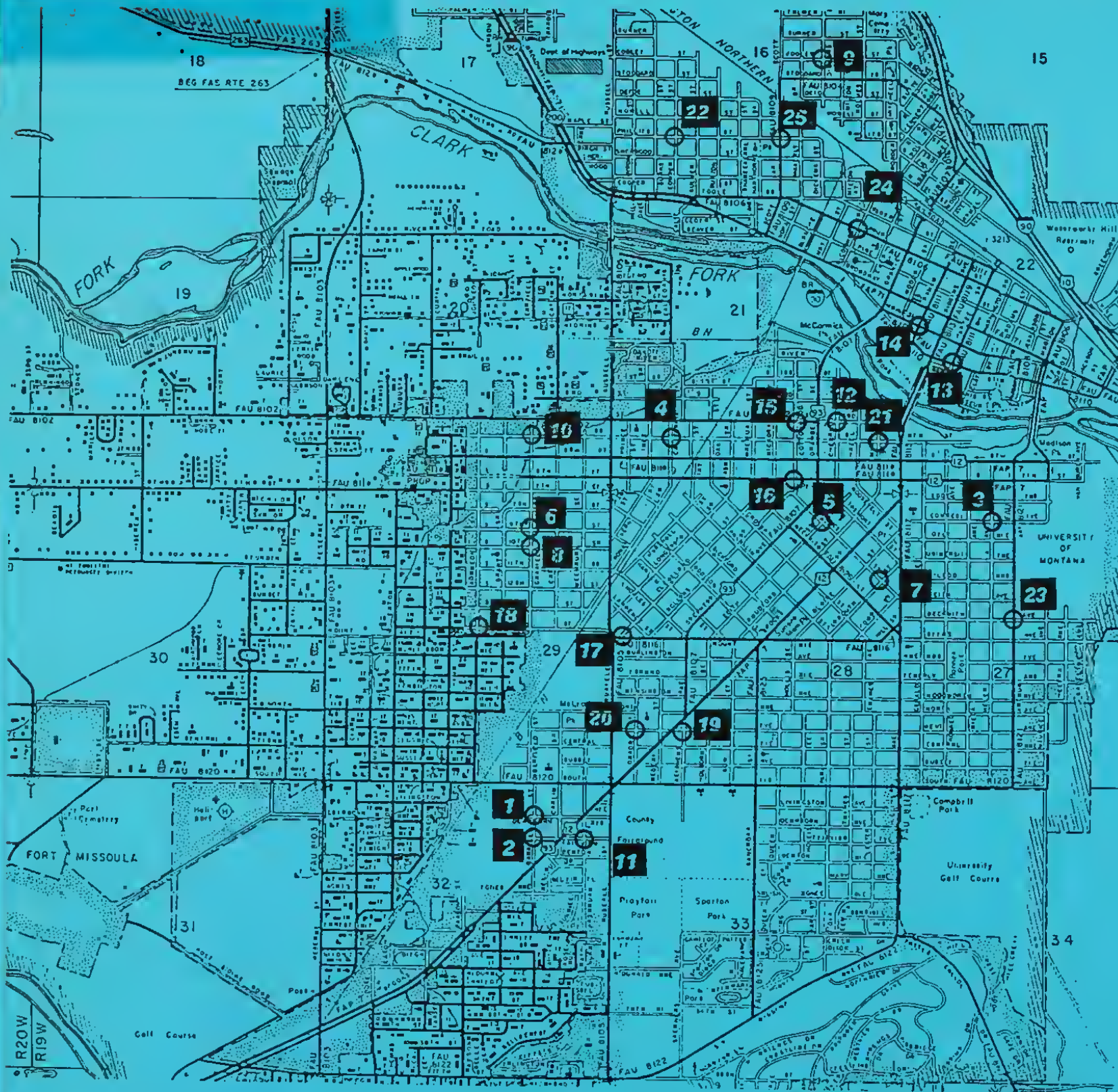
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TRAFFIC SAFETY IMPROVEMENT STUDY

SHEET INDEX



LOCATION MAP

DESCRIPTION			SHEET NUMBERS	
PLAN LEGEND			1	
SIGNING & PAVEMENT MARKING KEY			2	
PLAN SHEETS BY PRIORITY:			EXISTING	SHORT TERM
			CONDITION	IMPROVEMENT
1	DEARBORN	GARFIELD	3	4
2	FAIRVIEW	GARFIELD	5	6
3	CONNELL	HELEN	7	8
4	CALIFORNIA	FOURTH	9	10
5	FLORENCE	EDITH	11	12
6	GARFIELD	NINTH	13	14
7	PLYMOUTH	FLORENCE	15	16
8	GARFIELD	TENTH	17	18
9	COOLEY	DICKENS	19	20
10	GARFIELD	FOURTH	21	22
11	FAIRVIEW	WASHBURN	23	24
12	CHESTNUT	THIRD	25	26
13	FRONT	PATTEE	27	28
14	MAIN	RYMAN	29	30
15	COTTONWOOD	THIRD	31	32
16	COTTONWOOD	SIXTH	33	34
17	MOUNT	CLEVELAND	35	36
18	JOHNSON	FOURTEENTH	37	38
19	STEPHENS	KENT	39	40
20	KENT	OXFORD	41	42
21	MYRTLE	FOURTH	43	44
22	PHILLIPS	COWPER	45	46
23	ARTHUR	BECKWITH	47	48
24	SPRUCE	McCORMICK	49	50
25	SCOTT	PHILLIPS	51	52



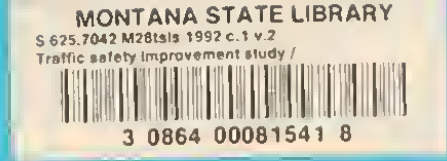
MARVIN & ASSOCIATES

Traffic, Transportation & Civil Engineers

1127 Alderson Ave. #204
Billings, MT 59102

EXISTING CONDITIONS & SHORT TERM IMPROVEMENTS

VOLUME II - PLAN SHEETS



LEGEND

	STEEL GRATE		GAS
	WATER VALVE		HEDGE
	WATER CAP		RASBERRY PATCH
	TIE DOWN		POWER BOX
	SHRUB		TELEPHONE BOX
	SUMP DRAIN		IRRIGATION CONTROL BOX
	TREE		WATER METER
	POWER POLE		LAMP POST
	BUILDING		POST
	CONC. CURB		STOP LIGHT
	CONC. CURB & GUTTER		HEDGE
	YELLOW PAINTED CURB		FIREHYDRANT
	FENCE		PARKING METER
	MANHOLE		BIKE RACK
	TELEPHONE MANHOLE		GRATE INLET
	SEWER MANHOLE		GUARD RAIL



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EXISTING CONDITION &
SHORT TERM IMPROVEMENTS

LEGEND TO DRAWINGS

SHEET
1



R1-1
30"x30"
(Unless Otherwise Noted)



R1-2
36"x36"x36"



R7-3ar
12"x18"



R7-3al
12"x18"



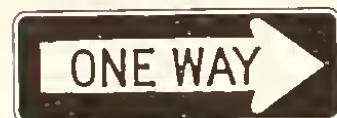
R7-1l
12"x18"



R7-1
12"x18"



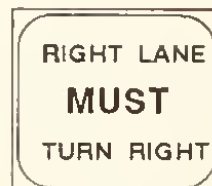
R7-1r
12"x18"



R6-1r
36"x12"



R6-1l
36"x12"



R3-7r
30"x30"



R3-1l
24"x24"



R3-1r
24"x24"



R3-5
30"x36"



R3-9b
24"x36"



R4-7
24"x30"



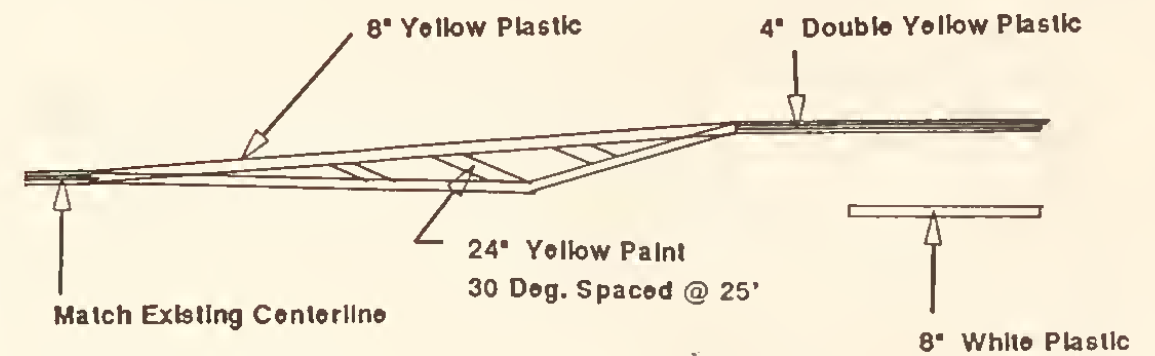
W11
30"x30"



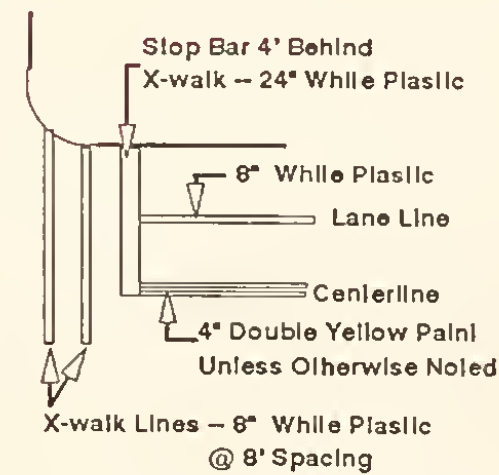
W11A-2
30"x30"



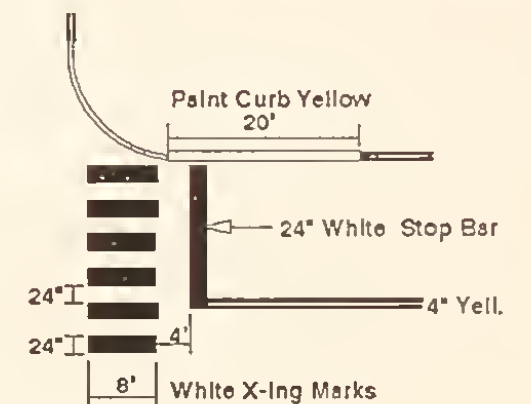
W3-1a
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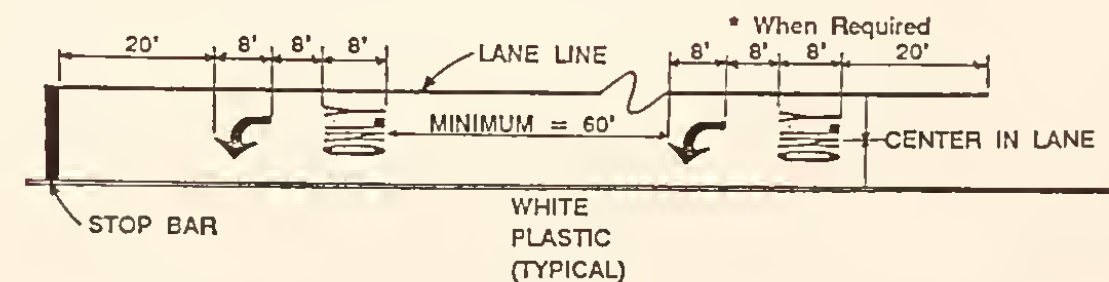
TYPICAL CENTER DIVIDER ISLAND MARKS



TYPICAL INTERSECTION MARKS



TYPICAL SCHOOL X-ING MARKINGS



TYPICAL WORDS & SYMBOLS LAYOUT



MARVIN & ASSOCIATES

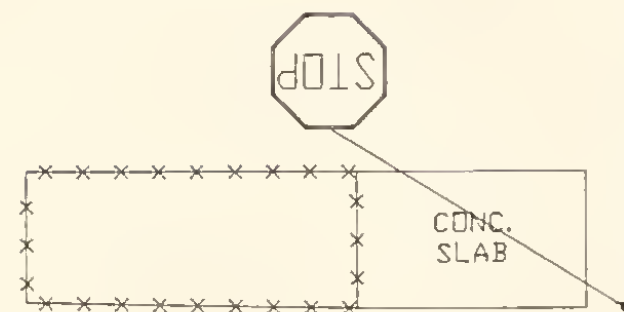
Traffic, Transportation & Civil Engineers

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Billings, MT 59102

SHORT TERM IMPROVEMENTS

SIGNING & PAVEMENT
MARKING KEY

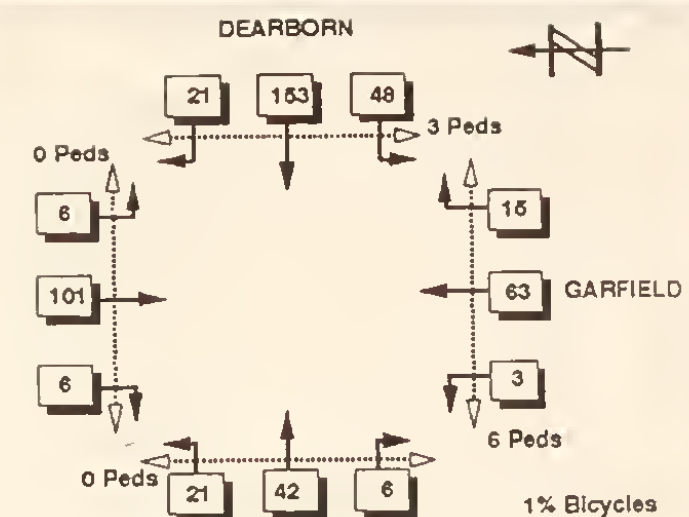
SHEET
2



37'-0"
ADT = 3700

SOUTHSIDE AUTO
RECONDITIONING SIGN

CRISS
CRAWFORD
INSURANCE



TRAFFIC MOVEMENTS 5:00 - 6:00 PM 7/1/92

ADT = 2900

Garfield Ave.

SEARS

ROCK

ACCIDENT STATISTICS

NO.	ACC.	YEAR		
3	1988	#INJ ACC	5	
3	1989	#FAT ACC	0	
3	1990	#PDO ACC	7	
3	1991	PERSON =	12	
12	TOTAL	NIGHTTIME	8%	

* No. of Persons Injured

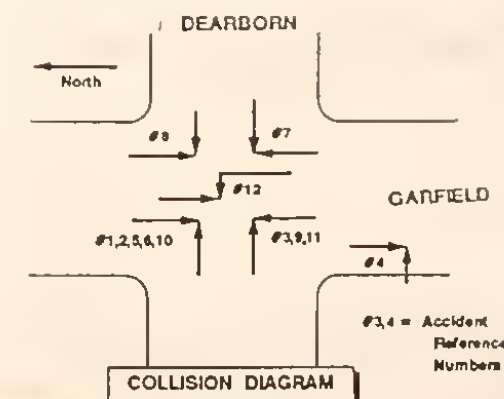
TYPES	NUMBER	ROAD	
ANGLE	11	DRY	42%
REAR END	0	WET	25%
SIDESWIPE	0	SNOW	8%
LEFT TRN	1	ICE	25%
OTHER	0	OTHER	0%

ADT = 3000

Dearborn Ave.

WEST FEDERAL
BANK SIGN

Garfield



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Billings, MT 59102

DEARBORN & GARFIELD

EXISTING CONDITIONS

SHEET
3



SCALE : 1" = 40'

PAINT CURBS YELLOW
IN ALL RESTRICTED AREAS

MARKING TO EXTEND
ADDITIONAL 200 FEET
TO THE INTERSECTION
WITH SOUTH AVENUE

ADT = 2900

Garfield Ave.

SEARS

NEW



NEW



TRIM TREE LINE

RESTRIPE CENTERLINE

ROCK

18'

Dearborn Ave.

37'-0"

ADT = 3000

NEW



NEW
36"x36"



REMOVE



CONC.
SLAB

NEW



37'-0"
ADT = 3700

100' NEW CENTERLINE

SOUTHSIDE AUTO
RECONDITIONING SIGN

NEW



CRISS
CRAWFORD
INSURANCE

NEW



ALLEY

ADT = 3100

YELLOW PAINT TWLT MARKS (Typ)

SYMBOLS - WHITE PAINT

11'

37'-0"

Dearborn

Garfield



REMOVE



NEW
36"x36"

@ NEW LOCATION
(Cantilever Support)



NEW

NEW



NEW



NEW



11'

37'-0"

GARFIELD & DEARBORN					COST ESTIMATE	
ITEM NO.	DESCRIPTION	QUAN	UNIT	PRICE	TOTAL COST	
1	NEW SIGNS (< 8 SP)	11	Ea	\$100.00	\$1,100.00	
2	NEW SIGNS (8.1 TO 10 SP)	2	Ea	\$140.00	\$280.00	
3	RELOCATE SIGNS	0	Ea	\$50.00	\$0.00	
4	REMOVE SIGNS	2	Ea	\$20.00	\$40.00	
5	PAVE. MARKINGS (PAINT)	11	Gal	\$15.00	\$165.00	
6	PAVE. MARKING PLASTIC	270	SP	\$3.00	\$810.00	
7	PLASTIC WORDS & SYMBOLS	80	SP	\$12.00	\$960.00	
8	CURB PAINT - YELLOW	10	Gal	\$15.00	\$150.00	
9	OBTERATE MARKS	33	SP	\$2.00	\$66.00	
10	TRIM TREES	1	LS	\$200.00	\$200.00	
11	MISCELLANEOUS	0	LS	\$50.00	\$0.00	
TOTAL CONSTRUCTION COSTS =					\$3,771.00	

GARFIELD & DEARBORN					
ACCIDENT TYPE	# ACC. IN PERIOD		EST. %	CHANGE IN # ACC.	
	YF	PD		YF	PD
HEAD ON	0	0	0%	0.0	0.0
ANGLE	4	7	60%	2.4	4.2
LEFT TURN	1	0	70%	0.7	0.0
SIDE SWIPE	0	0	0%	0.0	0.0
REAR END	0	0	0%	0.0	0.0
SINGLE VEHICLE	0	0	0%	0.0	0.0
PEDESTRIAN	0	0	0%	0.0	0.0
OTHER	0	0	0%	0.0	0.0
TOTALS:	5	7		3.1	4.2
% REDUCTION IN INJURY/FATAL ACCIDENTS =				62.0%	
% REDUCTION IN PROPERTY DAMAGE ACCIDENTS =				60.0%	



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Traffic, Transportation & Civil Engineers

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Billings, MT 59102

DEARBORN & GARFIELD

SHORT TERM IMPROVEMENTS

SHEET
4

ACCIDENT STATISTICS

NO.	ACC.	YEAR	TYPE	NUMBER	ROAD	PERCENT
1	1988	WFOV ACC	6	20	DRY	72%
2	1989	WFOV ACC	6	1	WET	7%
10	1990	WFOV ACC	18	1	SNOW	7%
7	1991	PERSON -	7	1	ICE	20%
25	TOTAL	NIGHTTIME	0%	2	OTHER	0%

* No. of Persons Injured



SCALE : 1" = 40'

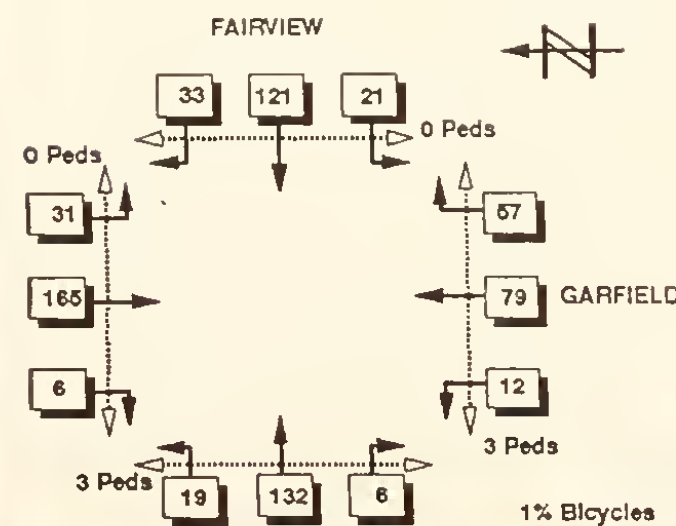
ADT = 3100

Garfield Ave.

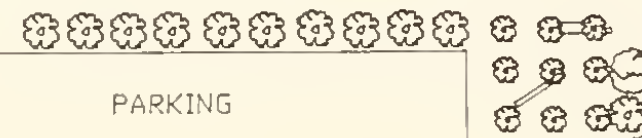
ADT = 3700

ADT = 3200

ADT = 2800



TRAFFIC MOVEMENTS 4:30 - 5:30 PM 5/5/92



PARKING

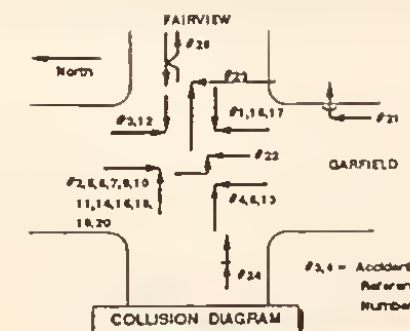
Fairview Ave.

FIRST BANK
SOUTHSIDE SIGN

1ST BANK
ENTRANCE

1ST BANK
EXIT

1ST BANK
ENTRANCE



COLLISION DIAGRAM

#1, #2, #3, #4 = Accident
Reference
Numbers



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1127 Alderson Ave. #204
Billings, MT 59102

FAIRVIEW & GARFIELD

EXISTING CONDITIONS

SHEET
5



SCALE : 1" = 40'

FAIRVIEW & GARFIELD

COST ESTIMATE

ITEM NO.	DESCRIPTION	QUAN	UNIT	UNIT PRICE	TOTAL COST
1	NEW SIGNS (< 6 SF)	9	Ea	\$100.00	\$900.00
2	NEW SIGNS (6.1 TO 10 SF)	2	Ea	\$140.00	\$280.00
3	RELOCATE SIGNS	2	Ea	\$50.00	\$100.00
4	REMOVE SIGNS	1	Ea	\$20.00	\$20.00
5	PAVE. MARKINGS (PAINT)	10	Gal	\$15.00	\$150.00
6	PAVE. MARKING PLASTIC	310	SF	\$3.00	\$930.00
7	PLASTIC WORDS & SYMBOLS	160	SF	\$12.00	\$1,920.00
8	CURE PAINT - YELLOW	12	Gal	\$15.00	\$180.00
9	OBLITERATE MARKS	170	SF	\$2.00	\$340.00
10	TRIM TREES	1	LS	\$100.00	\$100.00
11	MISC	0	SY	\$25.00	\$0.00
TOTAL CONSTRUCTION COSTS =					\$4,920.00

NEW 36"x36" STOP @ NEW LOCATION

Garfield

Fairview

REMOVE

OBLITERATE EXISTING WORDS & SYMBOLS & NEW WORDS & SYMBOLS AS SHOWN

MISSOULA IMPORTS

NEW

NEW

MISSOULA IMPORTS SERVICE ENTRANCE

MISSOULA IMPORTS ENTRANCE

ADT = 3200

ADT = 3100

4" YELLOW PAINT TWLT MARKS (Typ)

Garfield Ave.

WHITE PAINTED ARROWS

TRANSITION TO NEXT INTERSECTION

PAINT CURB YELLOW IN ALL RESTRICTED AREAS

PARKING

NEW

OBLITERATE EXISTING CENTERLINE

RESTRIPE CENTERLINE

Fairview Ave.

FIRST BANK SOUTHSIDE SIGN

RELOCATE 48"x48"

TRIM TREES

ADT = 2800

FAIRVIEW & GARFIELD					
ACCIDENT TYPE	# ACC. IN PERIOD		EST. %	CHANGE IN # ACC.	
	IF	PD		IF	PD
HEAD ON	0	0	0%	0.0	0.0
ANGLE	4	10	70%	2.8	11.2
LEFT TURN	0	1	70%	0.0	0.7
SIDE SWIPE	0	1	40%	0.0	0.4
REAR END	0	1	10%	0.0	0.1
SINGLE VEHICLE	0	0	0%	0.0	0.0
PEDESTRIAN	1	0	0%	0.0	0.0
OTHER	0	1	0%	0.0	0.0
TOTALS:	5	20		2.8	12.4
% REDUCTION IN INJURY/FATAL ACCIDENTS = 50.0%					
% REDUCTION IN PROPERTY DAMAGE ACCIDENTS = 62.0%					



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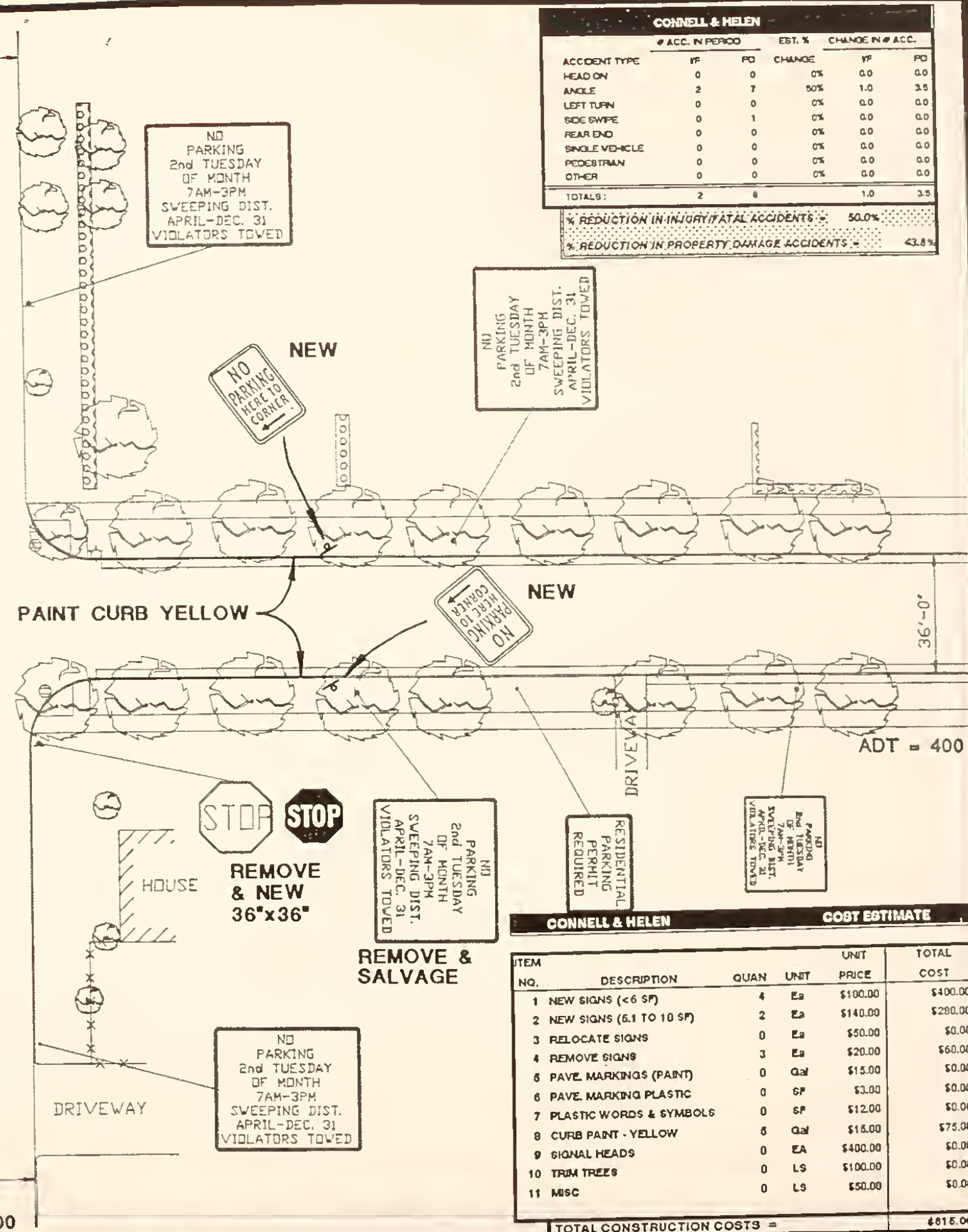
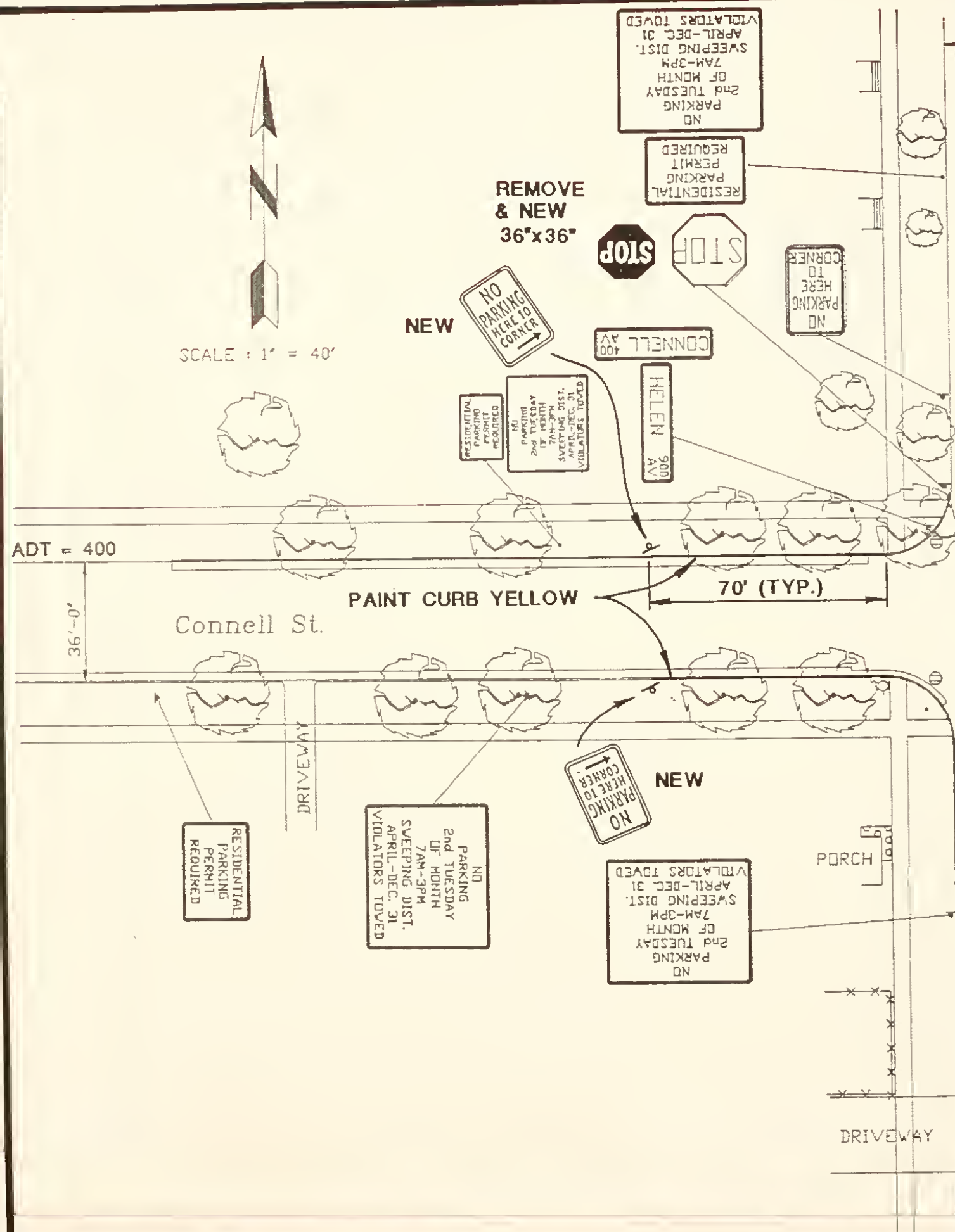
1127 Alderson Ave. #204
Billings, MT 59102

FAIRVIEW & GARFIELD

SHORT TERM IMPROVEMENTS

SHEET
6

SCALE : 1" = 40'



CONNELL & HELEN					
ACCIDENT TYPE	# ACC. IN PERIOD		EST. % CHANGE	CHANGE IN # ACC.	
	VF	PD		VF	PD
HEAD ON	0	0	0%	0.0	0.0
ANGLE	2	7	50%	1.0	3.5
LEFT TURN	0	0	0%	0.0	0.0
SIDE SWIPE	0	1	0%	0.0	0.0
REAR END	0	0	0%	0.0	0.0
SINGLE VEHICLE	0	0	0%	0.0	0.0
PEDESTRIAN	0	0	0%	0.0	0.0
OTHER	0	0	0%	0.0	0.0
TOTALS:	2	8		1.0	3.5
% REDUCTION IN INJURY/FATAL ACCIDENTS =				50.0%	
% REDUCTION IN PROPERTY DAMAGE ACCIDENTS =				43.8%	

CONNELL & HELEN					COST ESTIMATE
ITEM NO.	DESCRIPTION	QUAN	UNIT	PRICE	TOTAL COST
1	NEW SIGNS (<6 SF)	4	EA	\$100.00	\$400.00
2	NEW SIGNS (6.1 TO 10 SF)	2	EA	\$140.00	\$280.00
3	RELOCATE SIGNS	0	EA	\$50.00	\$0.00
4	REMOVE SIGNS	3	EA	\$20.00	\$60.00
5	PAVE MARKINGS (PAINT)	0	QAL	\$15.00	\$0.00
6	PAVE MARKING PLASTIC	0	SF	\$3.00	\$0.00
7	PLASTIC WORDS & SYMBOLS	0	SF	\$12.00	\$0.00
8	CURB PAINT - YELLOW	5	QAL	\$15.00	\$75.00
9	SIGNAL HEADS	0	EA	\$400.00	\$0.00
10	TRIM TREES	0	LS	\$100.00	\$0.00
11	MISC	0	LS	\$50.00	\$0.00
TOTAL CONSTRUCTION COSTS =					\$815.00



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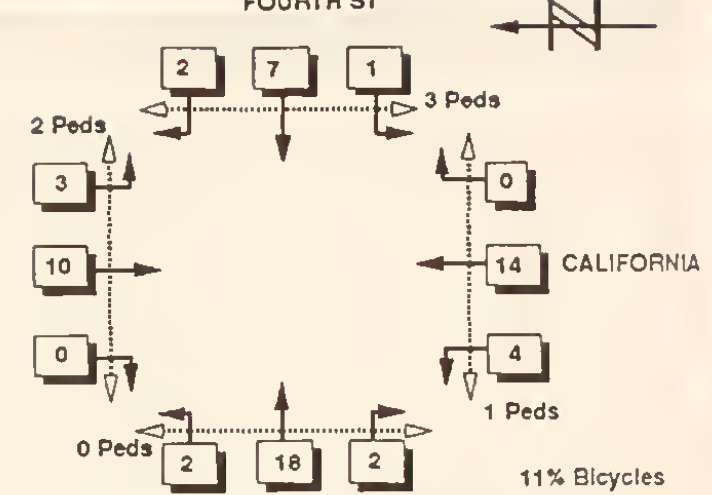
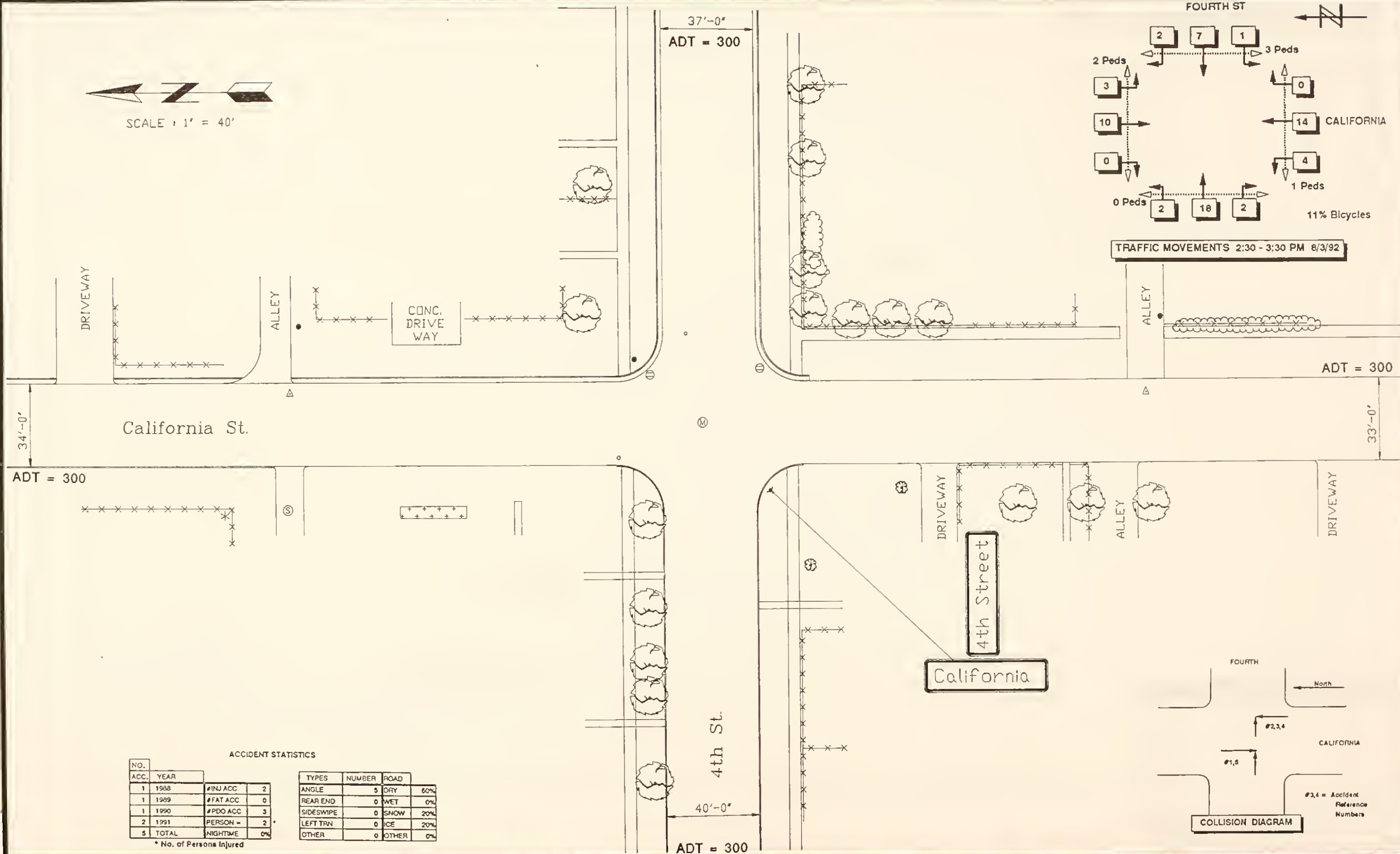
CONNELL & HELEN

SHORT TERM IMPROVEMENTS

SHEET
8



SCALE : 1' = 40'

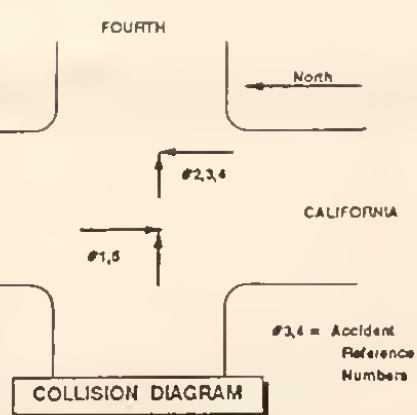


TRAFFIC MOVEMENTS 2:30 - 3:30 PM 8/3/92

ACCIDENT STATISTICS

NO.	ACC.	YEAR	TYPE	NUMBER	ROAD	PERCENT
1	1988	#INJ ACC	2	ANGLE	5	DRY 60%
1	1989	#FAT ACC	0	REAR END	0	WET 0%
1	1990	#PDO ACC	3	SIDESWIPE	0	SNOW 20%
2	1991	PERSON =	2	LEFT TRN	0	ICE 20%
5	TOTAL	NIGHTTIME	0%	OTHER	0	OTHER 0%

* No. of Persons Injured



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CALIFORNIA & FOURTH

EXISTING CONDITIONS

SHEET
9

CALIFORNIA & FOURTH

COST ESTIMATE

ITEM NO.	DESCRIPTION	QUAN	UNIT	UNIT PRICE	TOTAL COST
1	NEW SIGNS (<6 SF)	0	Ea	\$100.00	\$0.00
2	NEW SIGNS (6.1 TO 10 SF)	2	Ea	\$140.00	\$280.00
3	RELOCATE SIGNS	0	Ea	\$50.00	\$0.00
4	REMOVE SIGNS	0	Ea	\$20.00	\$0.00
5	PAVE. MARKINGS (PAINT)	0	Gal	\$15.00	\$0.00
6	PAVE. MARKING PLASTIC	0	SF	\$3.00	\$0.00
7	PLASTIC WORDS & SYMBOLS	0	SF	\$12.00	\$0.00
8	CURB PAINT - YELLOW	2	Gal	\$15.00	\$30.00
9	SIGNAL HEADS	0	EA	\$400.00	\$0.00
10	TRIM TREES	1	LS	\$100.00	\$100.00
11	SIGNAL MODIFICATIONS	0	LS	\$50.00	\$0.00

TOTAL CONSTRUCTION COSTS = \$410.00

PAINT CURB YELLOW
(30' TYP.)

STOP NEW

ADT = 300

California St.

ADT = 300

NEW

STOP

TRIM PINE TREE TO
MIN. 8' ABOVE GROUND

4th St.

ADT = 300

4th Street

California

CALIFORNIA & FOURTH

ACCIDENT TYPE	ACC. IN PERIOD		EST. %	CHANGE IN # ACC.	
	YF	PD		YF	PD
HEAD ON	0	0	0%	0.0	0.0
ANGLE	2	3	60%	1.2	1.8
LEFT TURN	0	0	0%	0.0	0.0
SIDE SWIPE	0	0	0%	0.0	0.0
REAR END	0	0	0%	0.0	0.0
SINGLE VEHICLE	0	0	0%	0.0	0.0
PEDESTRIAN	0	0	0%	0.0	0.0
OTHER	0	0	0%	0.0	0.0
TOTALS:	2	3		1.2	1.8

% REDUCTION IN INJURY/FATAL ACCIDENTS = 60.0%

% REDUCTION IN PROPERTY DAMAGE ACCIDENTS = 60.0%



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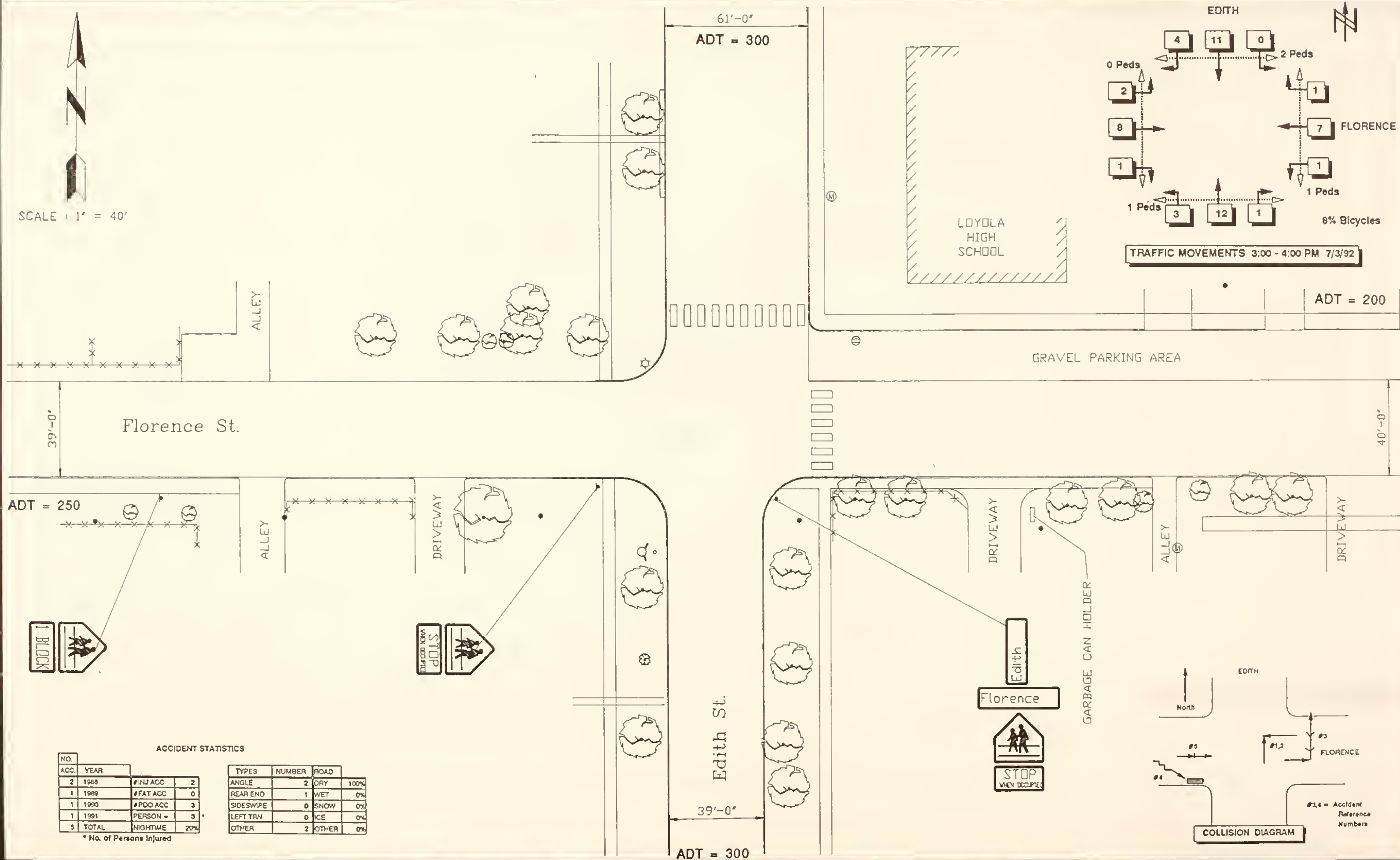
1127 Alderson Ave. #204
Billings, MT 59102

CALIFORNIA & FOURTH

SHORT TERM IMPROVEMENTS

SHEET
10

SCALE 1" = 40'



ADT = 250

61'-0"
ADT = 300

ADT = 200

ADT = 300

ACCIDENT STATISTICS

NO. ACC.	YEAR		
2	1988	#INJ ACC	2
1	1989	#FAT ACC	0
1	1990	#PDO ACC	3
1	1991	PERSON =	3
5	TOTAL	NIGHTIME	20%

* No. of Persons Injured

TYPES	NUMBER	ROAD	
ANGLE	2	DRY	100%
REAR END	1	WET	0%
SIDESWIPE	0	SNOW	0%
LEFT TRN	0	ICE	0%
OTHER	2	OTHER	0%



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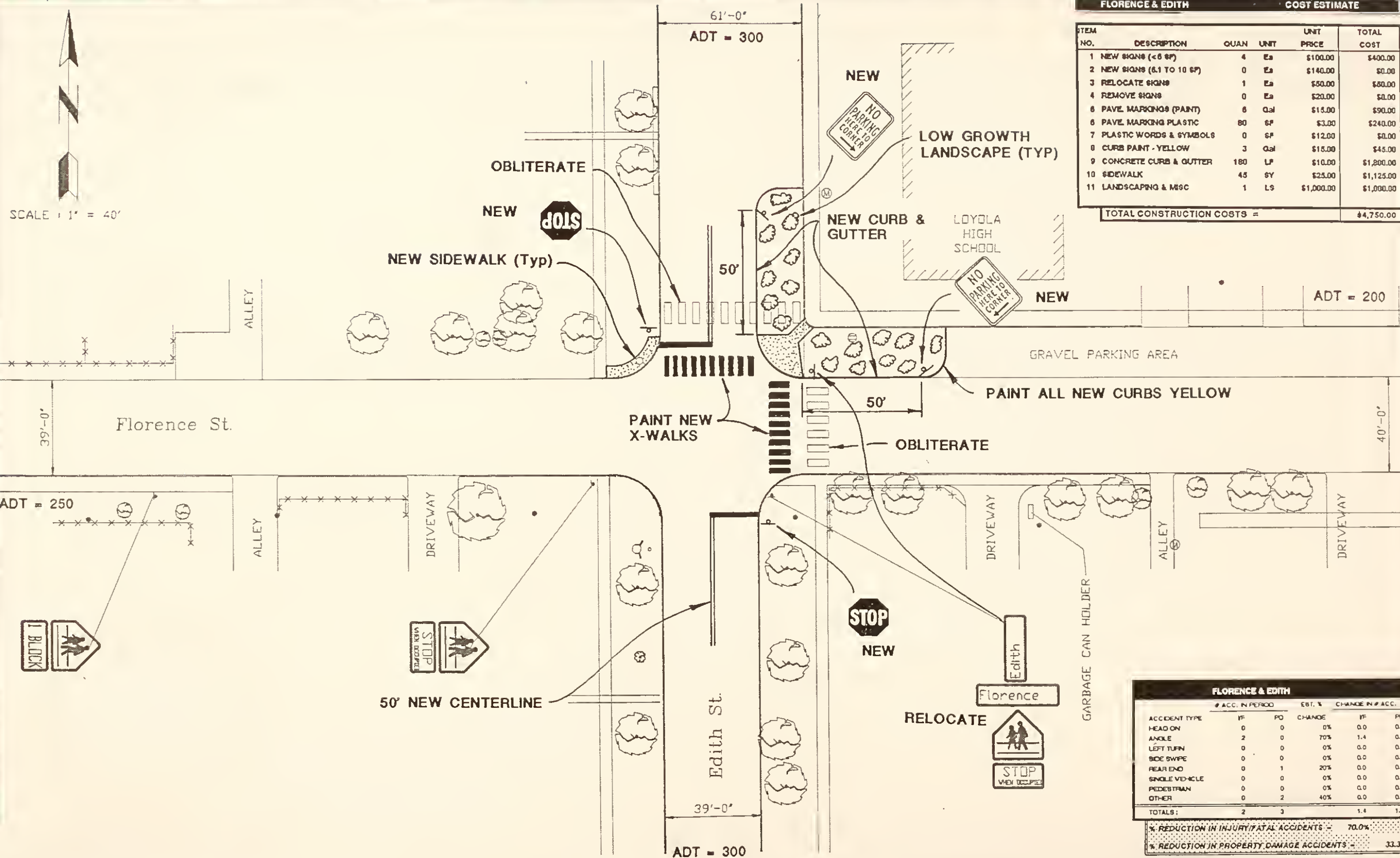
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FLORENCE & EDITH

EXISTING CONDITIONS

SHEET
11



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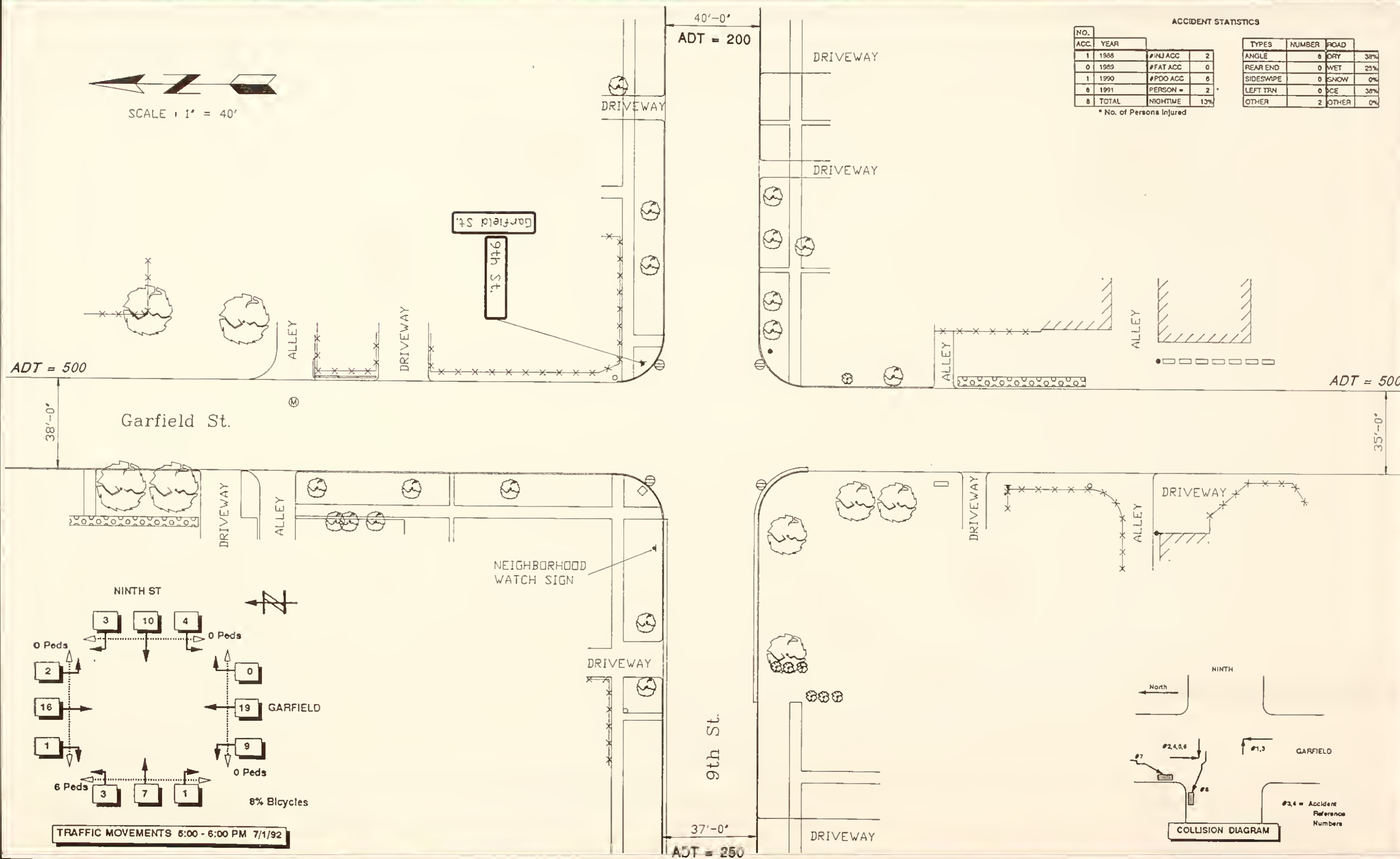
FLORENCE & EDITH

SHORT TERM IMPROVEMENTS

SHEET
12



SCALE : 1" = 40'



ACCIDENT STATISTICS

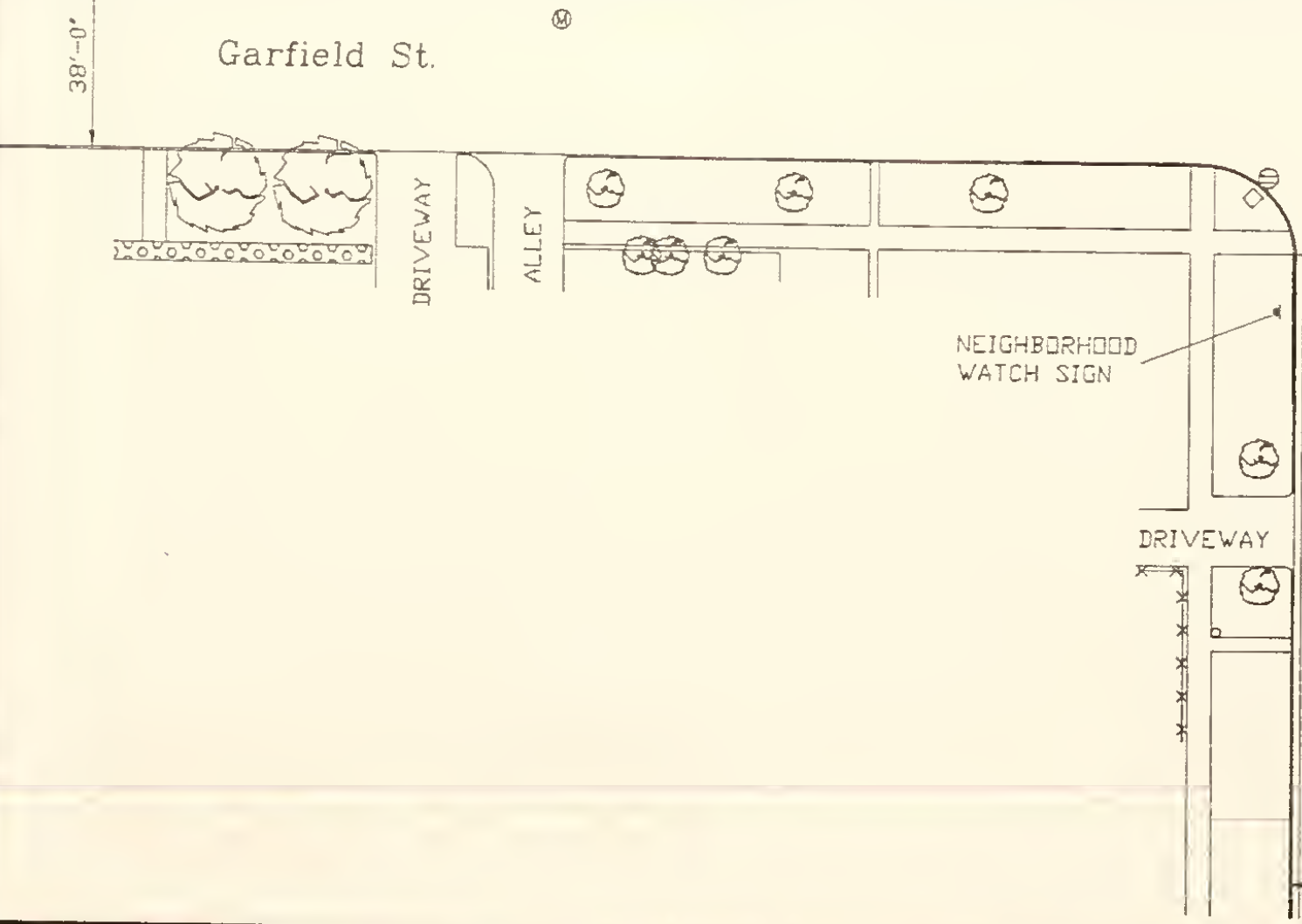
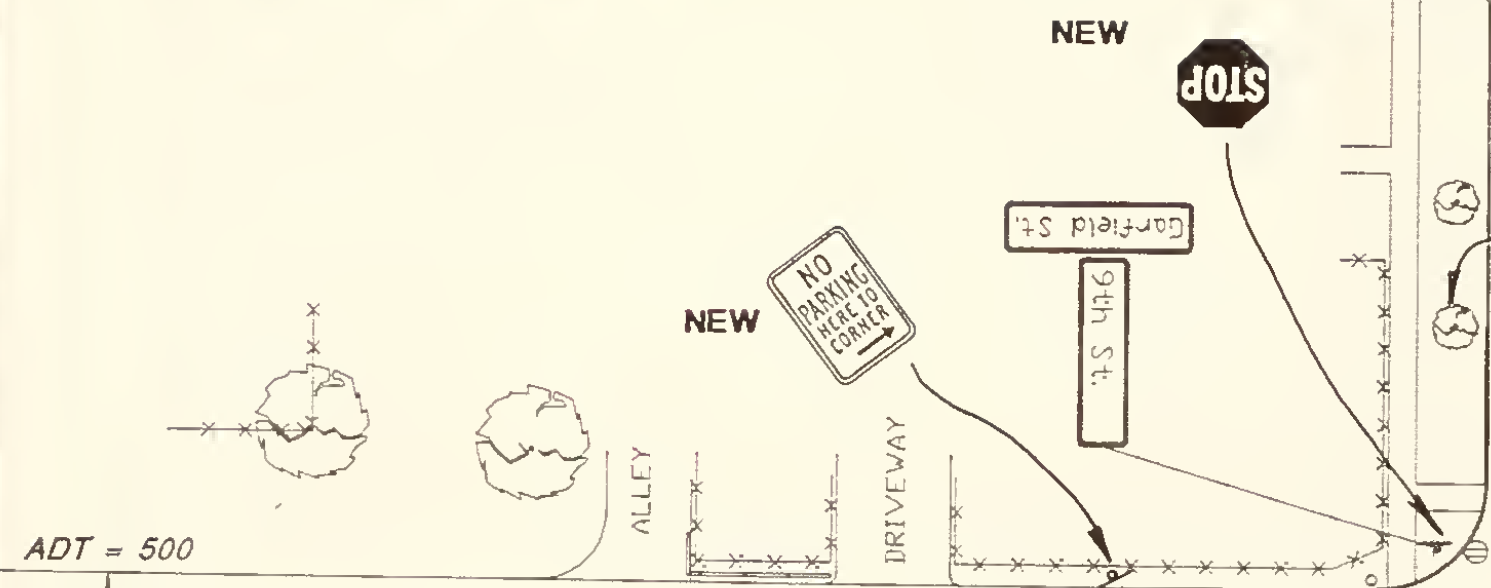
NO.	ACC.	YEAR	# INJ ACC	# FATAL ACC	# PDO ACC	PERSON =	NIGHTTIME
1	1988		2	0	6	2	13%
0	1989		0	0	0		
1	1990		0	0	0		
6	1991		0	0	0		
8	TOTAL		2	0	6		13%

* No. of Persons Injured

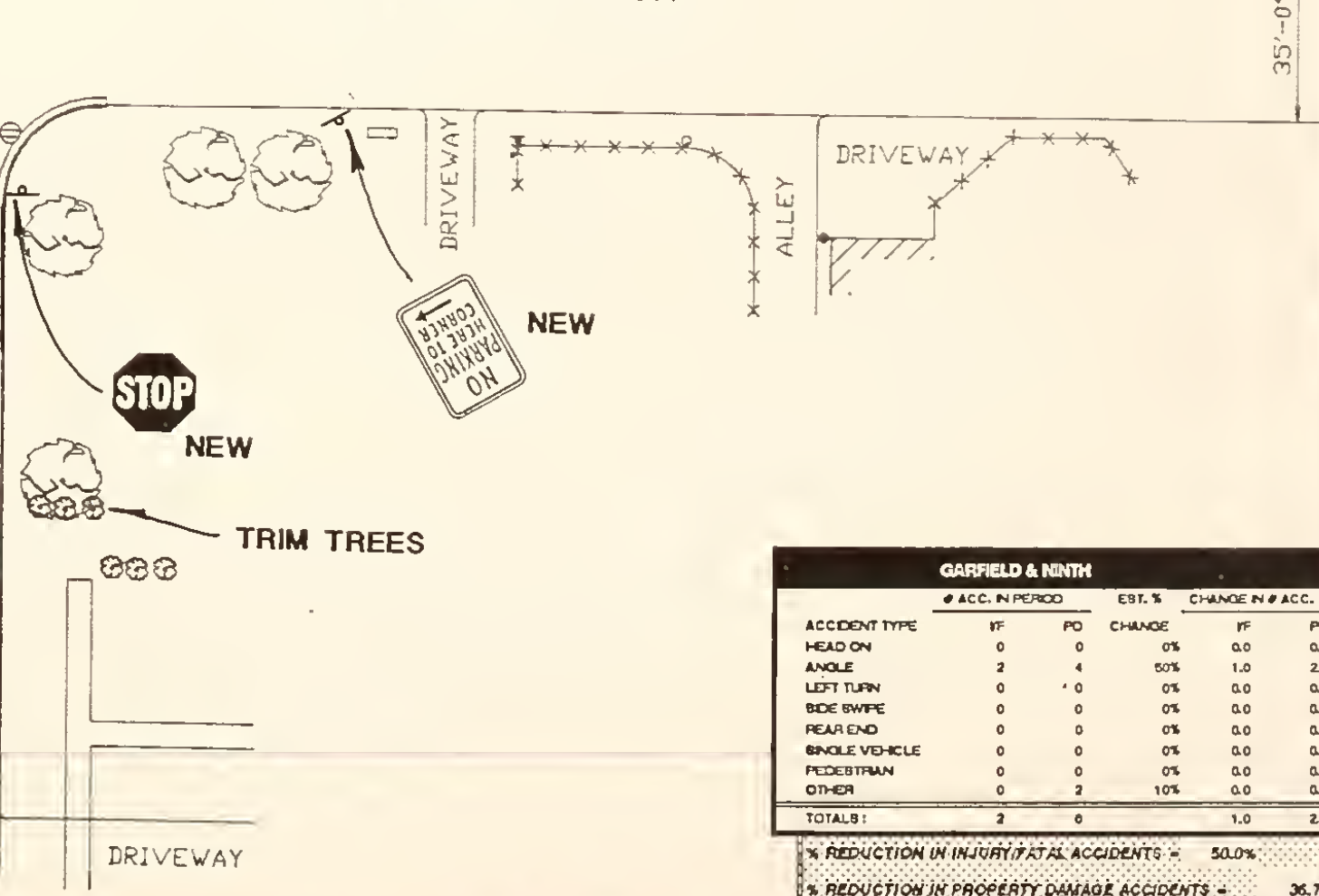
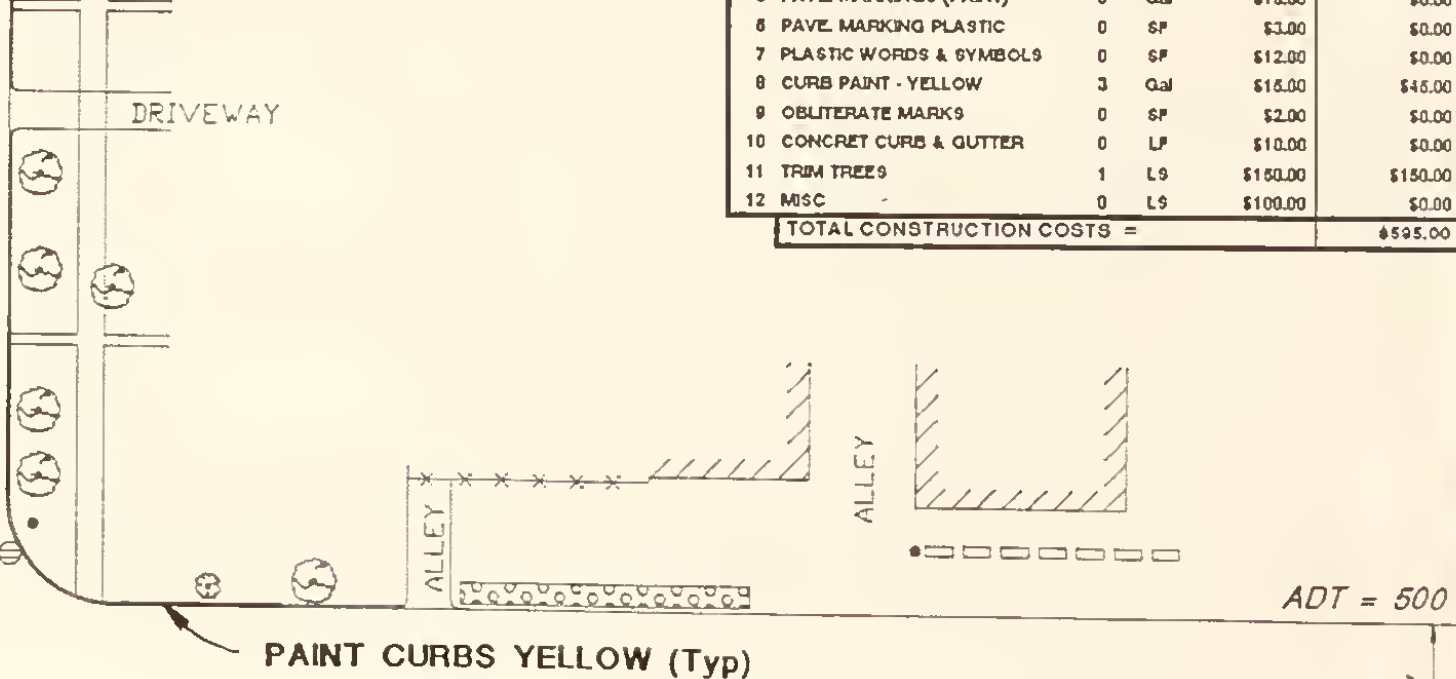
TYPES	NUMBER	ROAD	PERCENT
ANGLE	0	DRY	38%
REAR END	0	WET	25%
SIDESWIPE	0	SNOW	0%
LEFT TRN	0	ICE	38%
OTHER	2	OTHER	0%



SCALE : 1" = 40'



NEW
STOP
Garfield St.
9th St.
TRIM TREE



GARFIELD & NINTH				COST ESTIMATE	
ITEM NO.	DESCRIPTION	QUAN	UNIT	PRICE	TOTAL COST
1	NEW SIGNS (< 6 SF)	4	Ea	\$100.00	\$400.00
2	NEW SIGNS (6.1 TO 10 SF)	0	Ea	\$140.00	\$0.00
3	RELOCATE SIGNS	0	Ea	\$50.00	\$0.00
4	REMOVE SIGNS	0	Ea	\$20.00	\$0.00
5	PAVE MARKINGS (PAINT)	0	Gal	\$15.00	\$0.00
6	PAVE MARKING PLASTIC	0	SF	\$3.00	\$0.00
7	PLASTIC WORDS & SYMBOLS	0	SF	\$12.00	\$0.00
8	CURB PAINT - YELLOW	3	Gal	\$15.00	\$45.00
9	OBLITERATE MARKS	0	SF	\$2.00	\$0.00
10	CONCRET CURB & GUTTER	0	LF	\$10.00	\$0.00
11	TRIM TREES	1	LS	\$150.00	\$150.00
12	MISC	0	LS	\$100.00	\$0.00
TOTAL CONSTRUCTION COSTS =					\$595.00

GARFIELD & NINTH					
ACCIDENT TYPE	ACC. IN PERIOD		EST. % CHANGE	CHANGE IN # ACC.	
	YF	PD		YF	PD
HEAD ON	0	0	0%	0.0	0.0
ANGLE	2	4	50%	1.0	2.0
LEFT TURN	0	0	0%	0.0	0.0
BIDE SWIPE	0	0	0%	0.0	0.0
REAR END	0	0	0%	0.0	0.0
SINGLE VEHICLE	0	0	0%	0.0	0.0
PEDESTRIAN	0	0	0%	0.0	0.0
OTHER	0	2	10%	0.0	0.2
TOTALS:	2	6		1.0	2.2
% REDUCTION IN INJURY/FATAL ACCIDENTS =				50.0%	
% REDUCTION IN PROPERTY DAMAGE ACCIDENTS =				36.7%	



MARVIN & ASSOCIATES
Traffic, Transportation & Civil Engineers

1127 Alderson Ave. #204
Billings, MT 59102

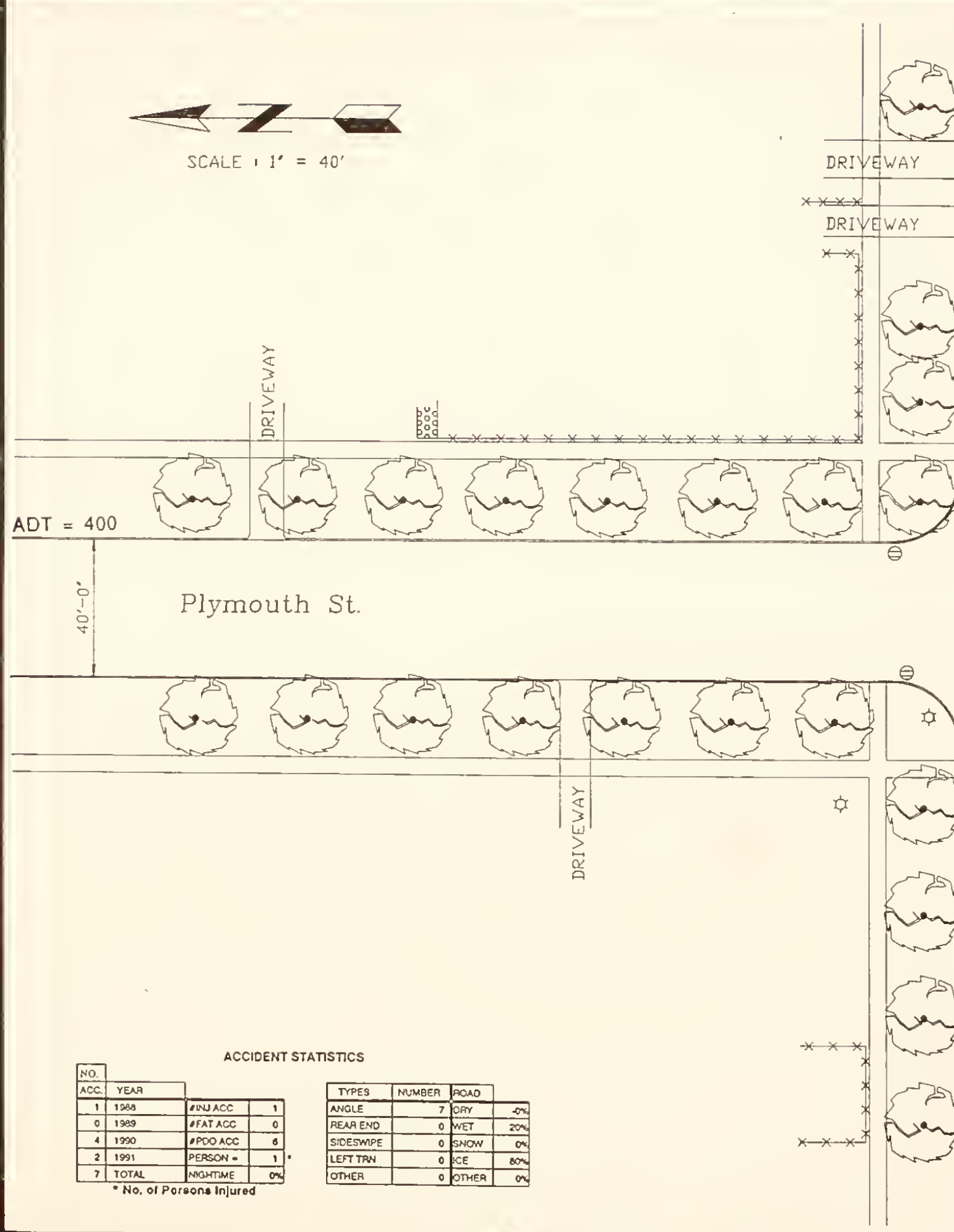
GARFIELD & NINTH

SHORT TERM IMPROVEMENTS

SHEET
14



SCALE : 1" = 40'

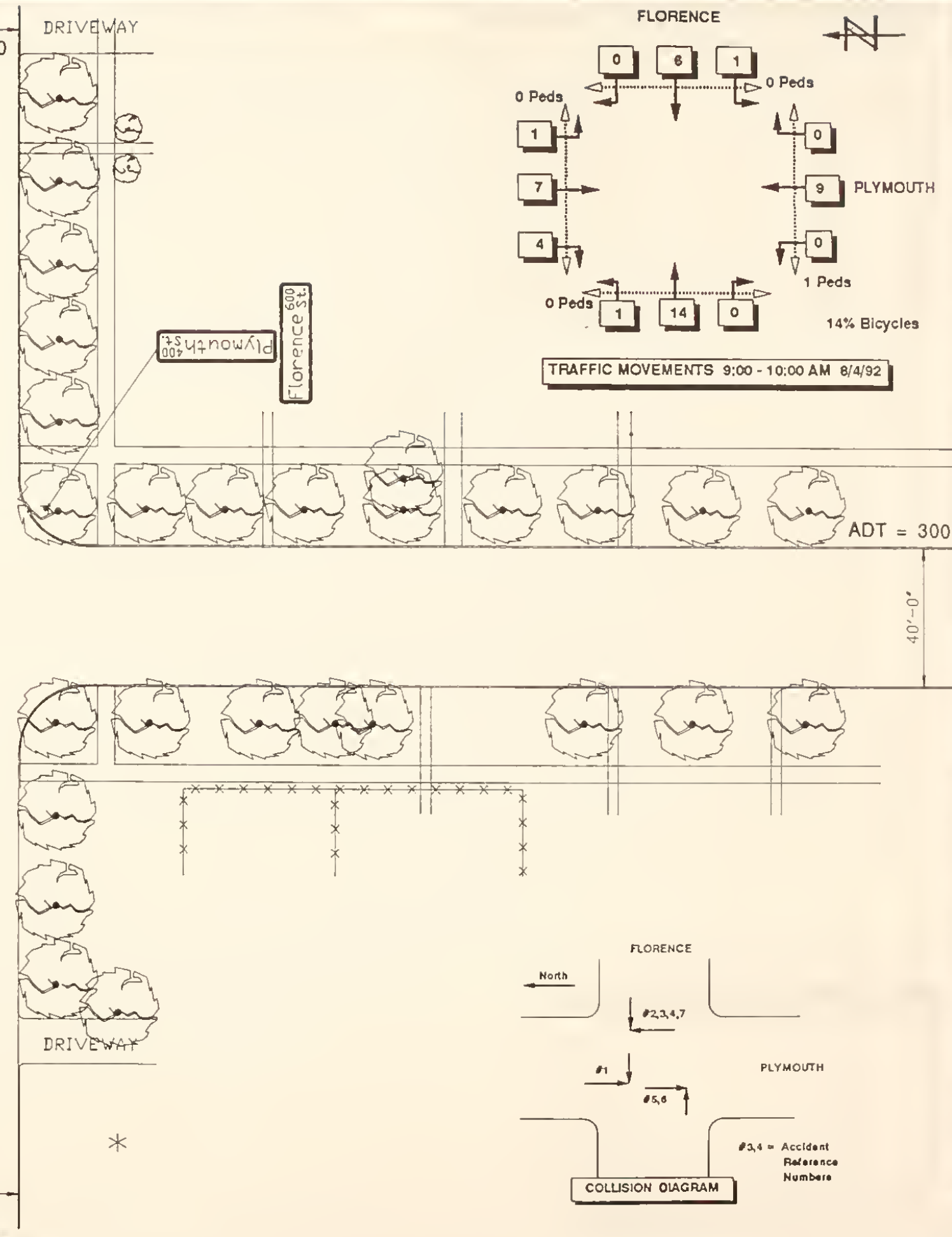


ACCIDENT STATISTICS

NO.	ACC.	YEAR	#INJ ACC	1
1	1988		#FAT ACC	0
0	1989		#PDO ACC	6
4	1990		PERSON =	1
2	1991		NIGHTTIME	0%
7	TOTAL			

* No. of Persons Injured

TYPES	NUMBER	ROAD	
ANGLE	7	DRY	~5%
REAR END	0	WET	20%
SIDESWIPE	0	SNOW	0%
LEFT TRN	0	ICE	80%
OTHER	0	OTHER	0%



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Traffic, Transportation & Civil Engineers

1127 Alderson Ave. #204
Billings, MT 59102

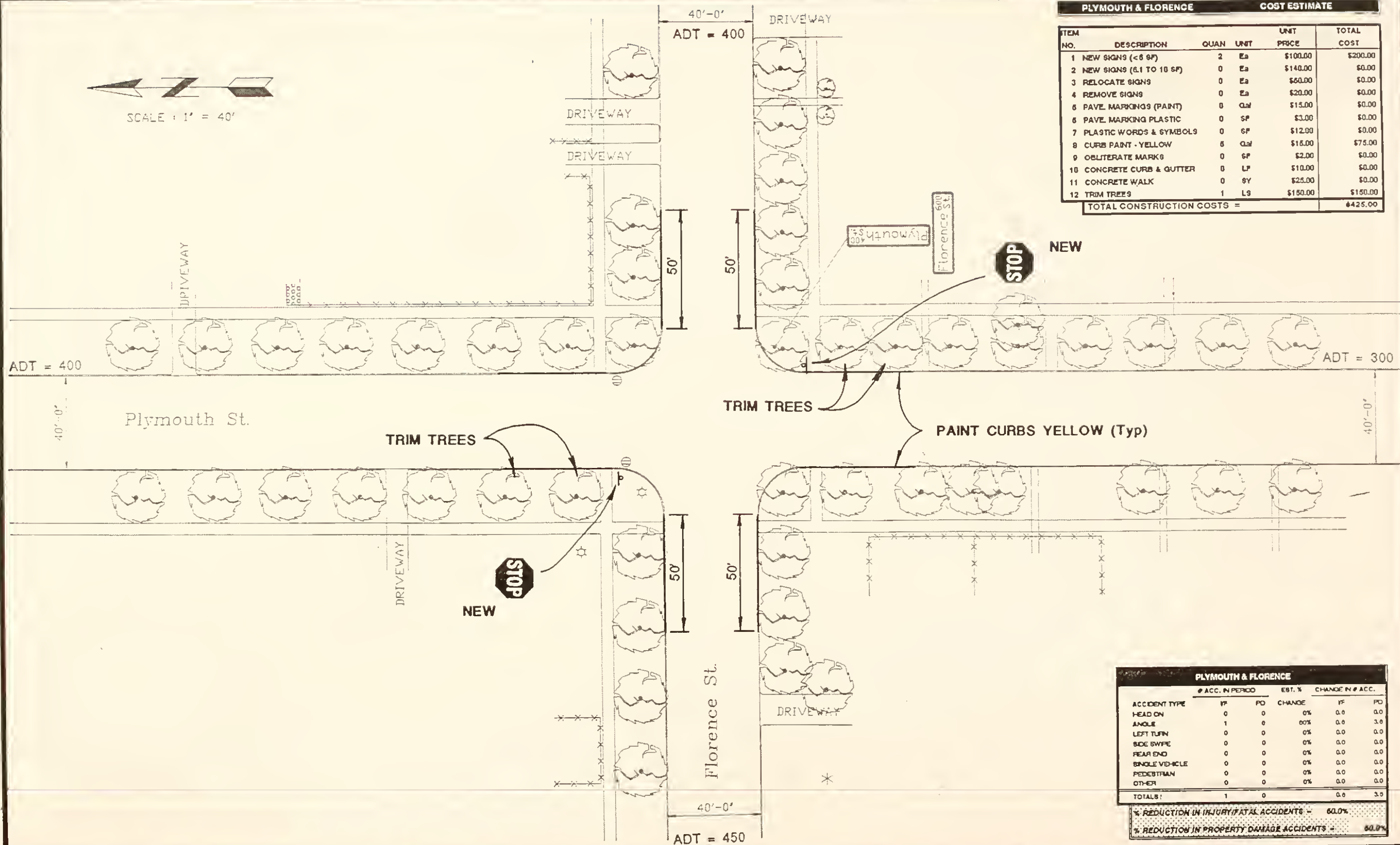
PLYMOUTH & FLORENCE

EXISTING CONDITIONS

SHEET
15



SCALE : 1" = 40'



PLYMOUTH & FLORENCE

COST ESTIMATE

ITEM NO.	DESCRIPTION	QUAN	UNIT	PRICE	TOTAL COST
1	NEW SIGNS (< 8 SF)	2	Ea	\$100.00	\$200.00
2	NEW SIGNS (8.1 TO 10 SF)	0	Ea	\$140.00	\$0.00
3	RELOCATE SIGNS	0	Ea	\$50.00	\$0.00
4	REMOVE SIGNS	0	Ea	\$20.00	\$0.00
5	PAVE MARKINGS (PAINT)	0	Gal	\$15.00	\$0.00
6	PAVE MARKING PLASTIC	0	SF	\$3.00	\$0.00
7	PLASTIC WORDS & SYMBOLS	0	SF	\$12.00	\$0.00
8	CURB PAINT - YELLOW	6	Gal	\$15.00	\$75.00
9	OBLITERATE MARKS	0	SF	\$2.00	\$0.00
10	CONCRETE CURB & GUTTER	0	LF	\$10.00	\$0.00
11	CONCRETE WALK	0	SY	\$25.00	\$0.00
12	TRIM TREES	1	LG	\$150.00	\$150.00
TOTAL CONSTRUCTION COSTS =					\$425.00

PLYMOUTH & FLORENCE

ACCIDENT TYPE	# ACC. IN PERIOD		EST. % CHANGE	CHANGE IN # ACC.	
	IF	PD		IF	PD
HEAD ON	0	0	0%	0.0	0.0
ANGLE	1	0	00%	0.0	3.0
LEFT TURN	0	0	0%	0.0	0.0
SIDE SWIPE	0	0	0%	0.0	0.0
REAR END	0	0	0%	0.0	0.0
SINGLE VEHICLE	0	0	0%	0.0	0.0
PEDESTRIAN	0	0	0%	0.0	0.0
OTHER	0	0	0%	0.0	0.0
TOTALS:	1	0		0.0	3.0

% REDUCTION IN INJURY/FATAL ACCIDENTS - 60.0%

% REDUCTION IN PROPERTY DAMAGE ACCIDENTS - 60.0%



MARVIN & ASSOCIATES

Traffic, Transportation & Civil Engineers

1127 Alderson Ave. #204
Billings, MT 59102

PLYMOUTH & FLORENCE

SHORT TERM IMPROVEMENTS

SHEET
16

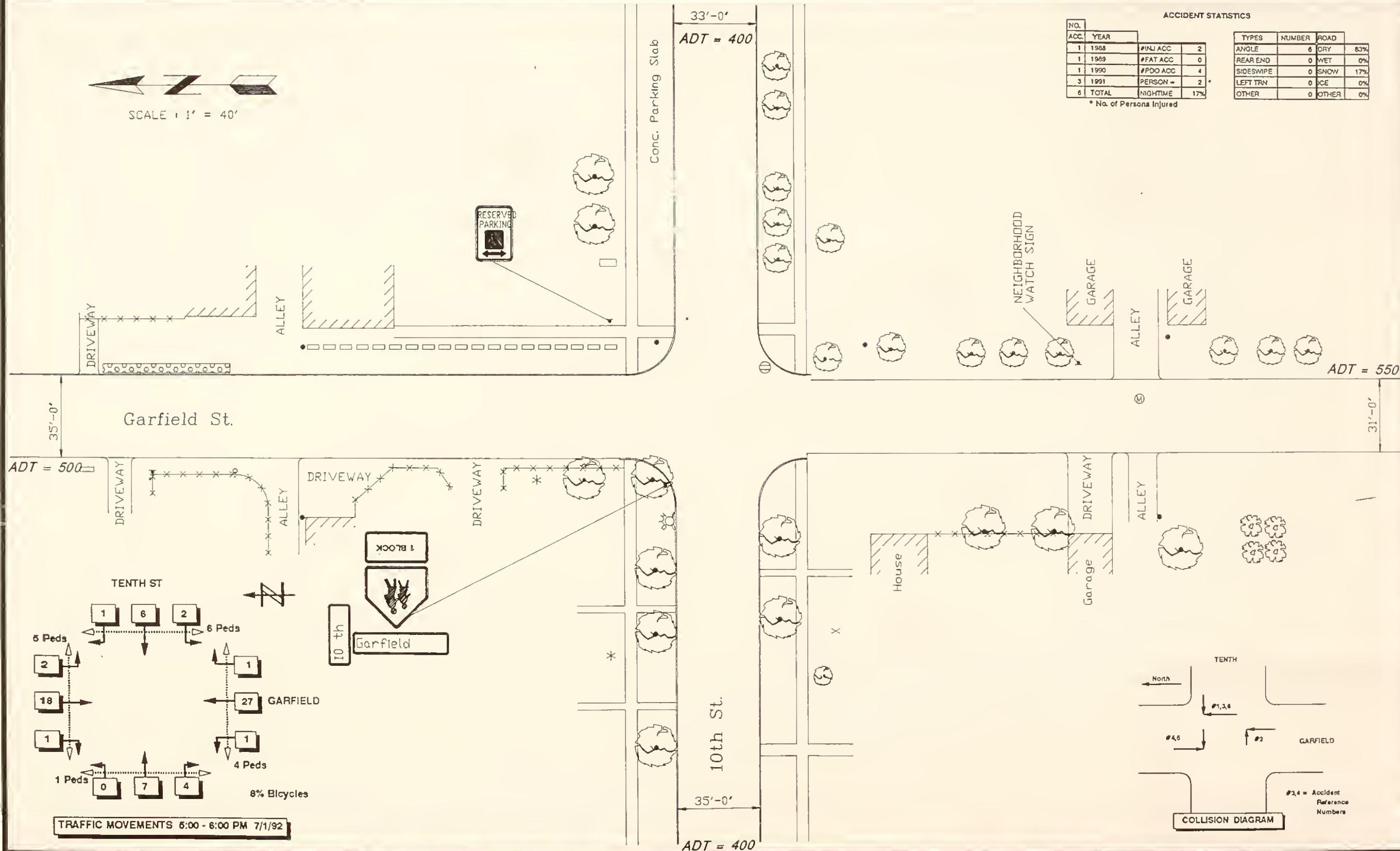


SCALE: 1" = 40'

ACCIDENT STATISTICS			
NO.	ACC.	YEAR	
1	1988	#INJ ACC	2
1	1989	#FAT ACC	0
1	1990	#POD ACC	4
3	1991	PERSON =	2
6	TOTAL	NIGHTTIME	17%

* No. of Persons Injured

TYPES	NUMBER	ROAD	
ANGLE	6	DRY	83%
REAR END	0	WET	0%
SIDESWIP	0	SNOW	17%
LEFT TRN	0	ICE	0%
OTHER	0	OTHER	0%



MARVIN & ASSOCIATES

Traffic, Transportation & Civil Engineers

1127 Alderson Ave. #204
Billings, MT 59102

GARFIELD & TENTH

EXISTING CONDITIONS

SHEET
17



SCALE : 1" = 40'

NEW



Conc. Parking Slab

33'-0"
ADT = 400

30'

NEW



NEIGHBORHOOD
WATCH SIGN

GARAGE

ALLEY

GARAGE

ADT = 550

NEW CURB & GUTTER

40'

Garfield St.

PAINT CURBS YELLOW (Typ)

ADT = 500

DRIVEWAY

DRIVEWAY

DRIVEWAY

10th

Garfield

10th St.

35'-0"

ADT = 400



NEW

TRIM LOWER BRANCHES

DRIVEWAY

ALLEY

Garage

GARFIELD & TENTH

ACCIDENT TYPE	# ACC. IN PERIOD		EST. % CHANGE	CHANGE IN # ACC.	
	IF	PD		IF	PD
HEAD ON	0	0	0%	0.0	0.0
ANGLE	2	4	00%	1.2	2.4
LEFT TURN	0	0	0%	0.0	0.0
SIDE SWIPE	0	0	0%	0.0	0.0
REAR END	0	0	0%	0.0	0.0
SINGLE VEHICLE	0	0	0%	0.0	0.0
PEDESTRIAN	0	0	0%	0.0	0.0
OTHER	0	0	0%	0.0	0.0
TOTALS:	2	4		1.2	2.4

% REDUCTION IN INJURY/FATAL ACCIDENTS = 60.0%

% REDUCTION IN PROPERTY DAMAGE ACCIDENTS = 60.0%



MARVIN & ASSOCIATES

Traffic, Transportation & Civil Engineers

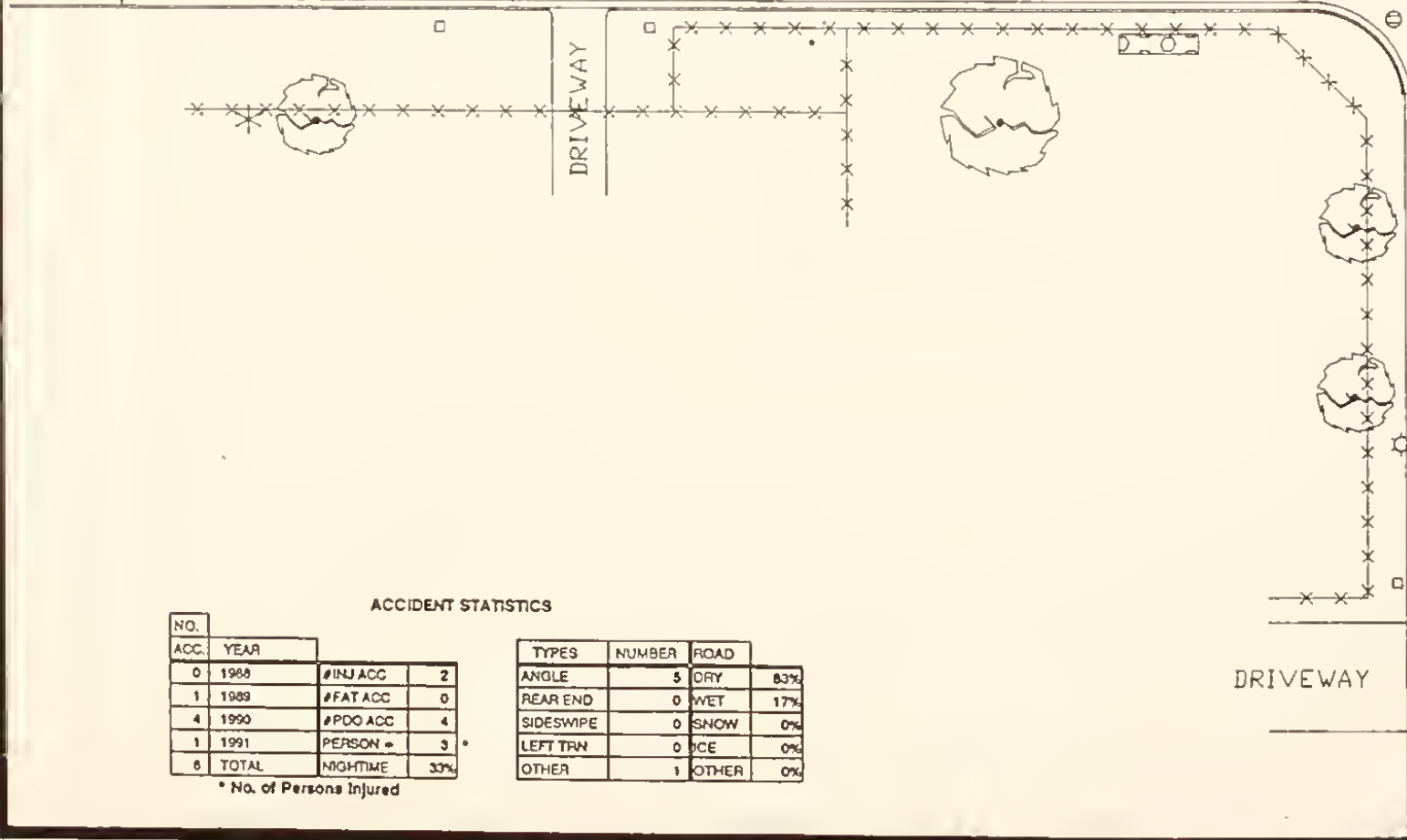
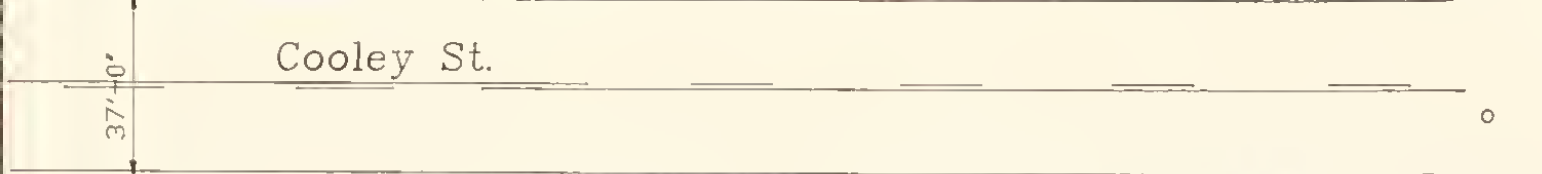
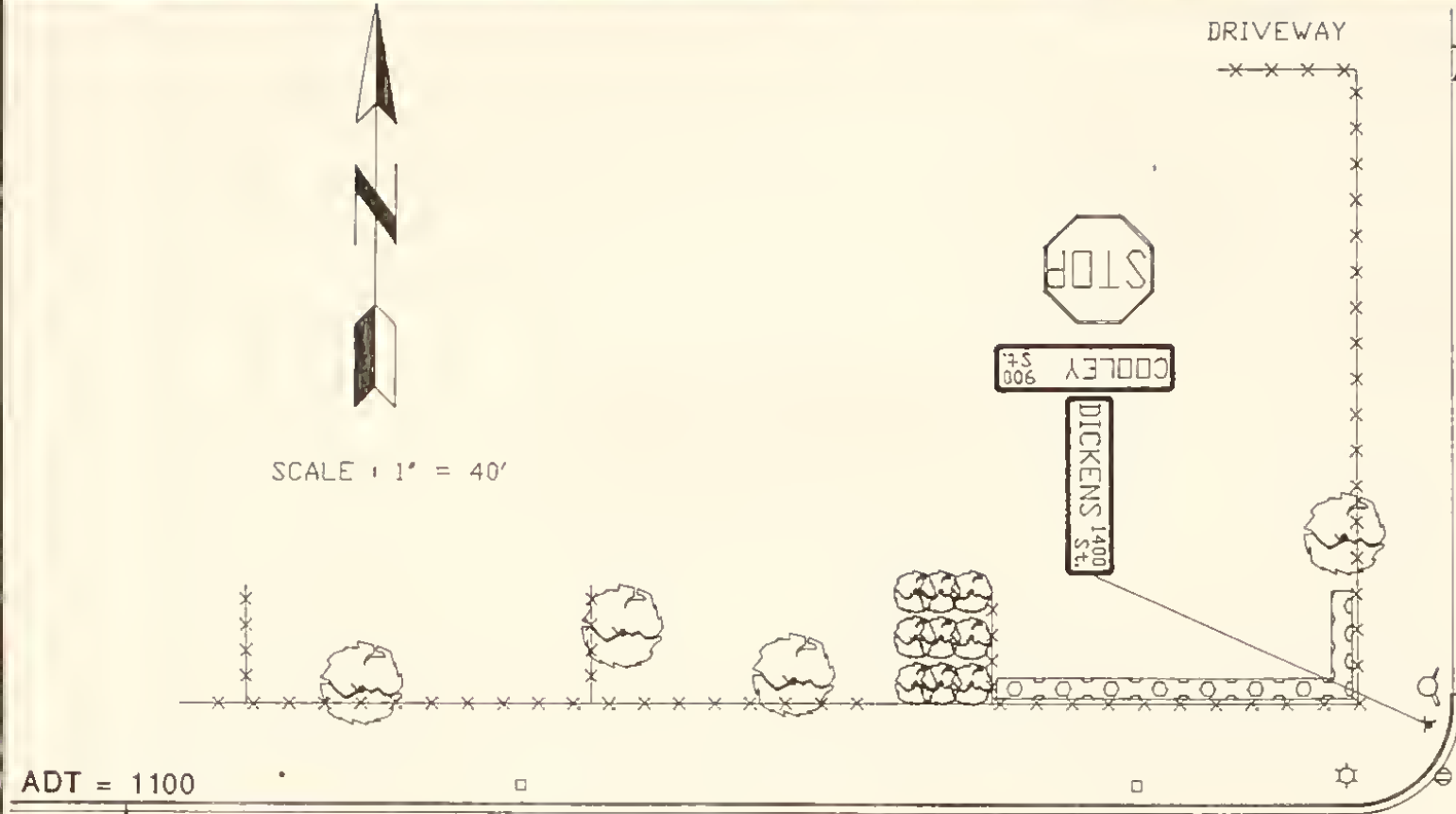
1127 Alderson Ave. #204
Billings, MT 59102

GARFIELD & TENTH

SHORT TERM IMPROVEMENTS

SHEET
18

SCALE: 1" = 40'



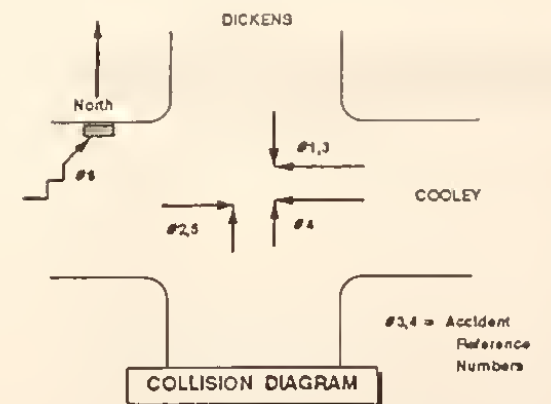
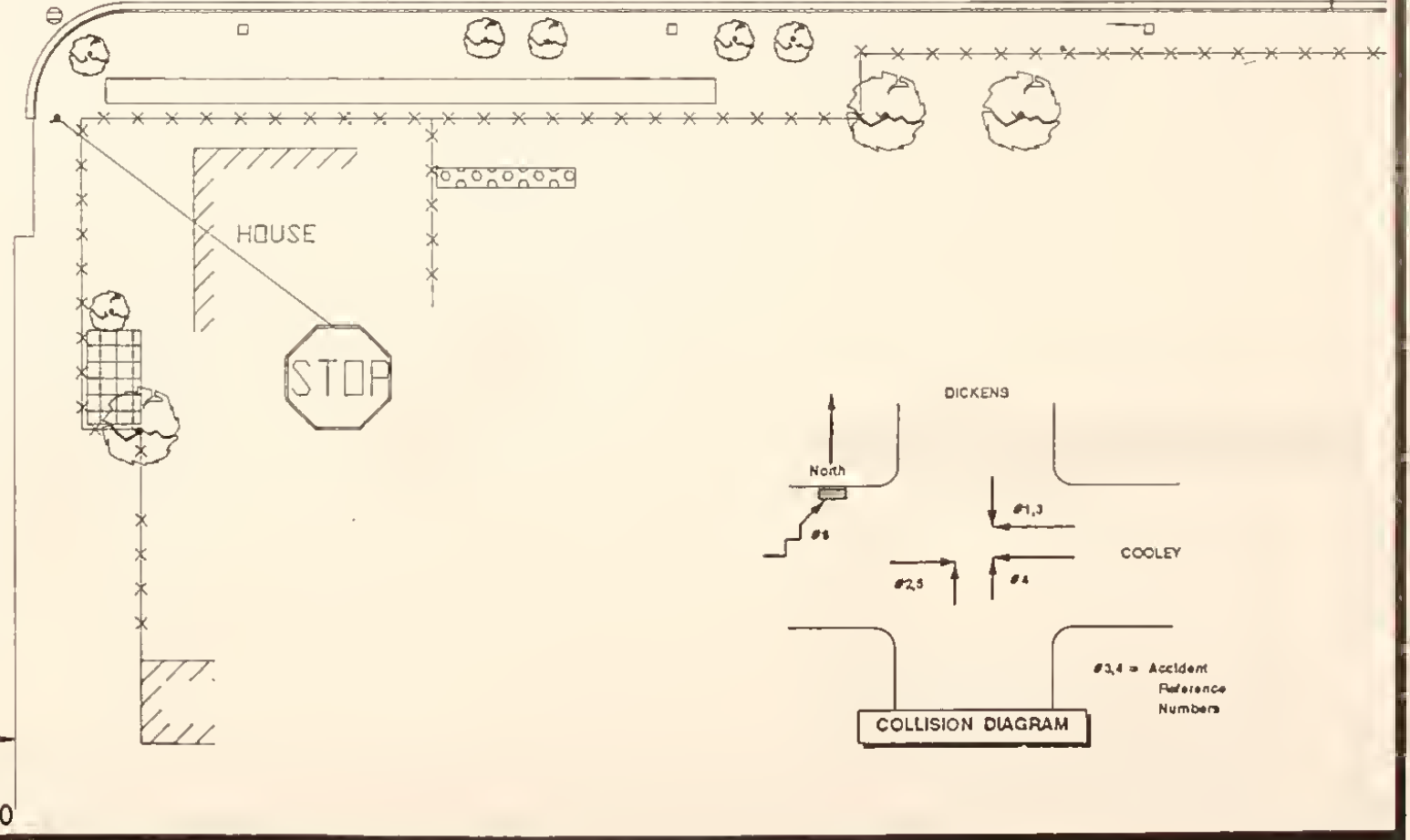
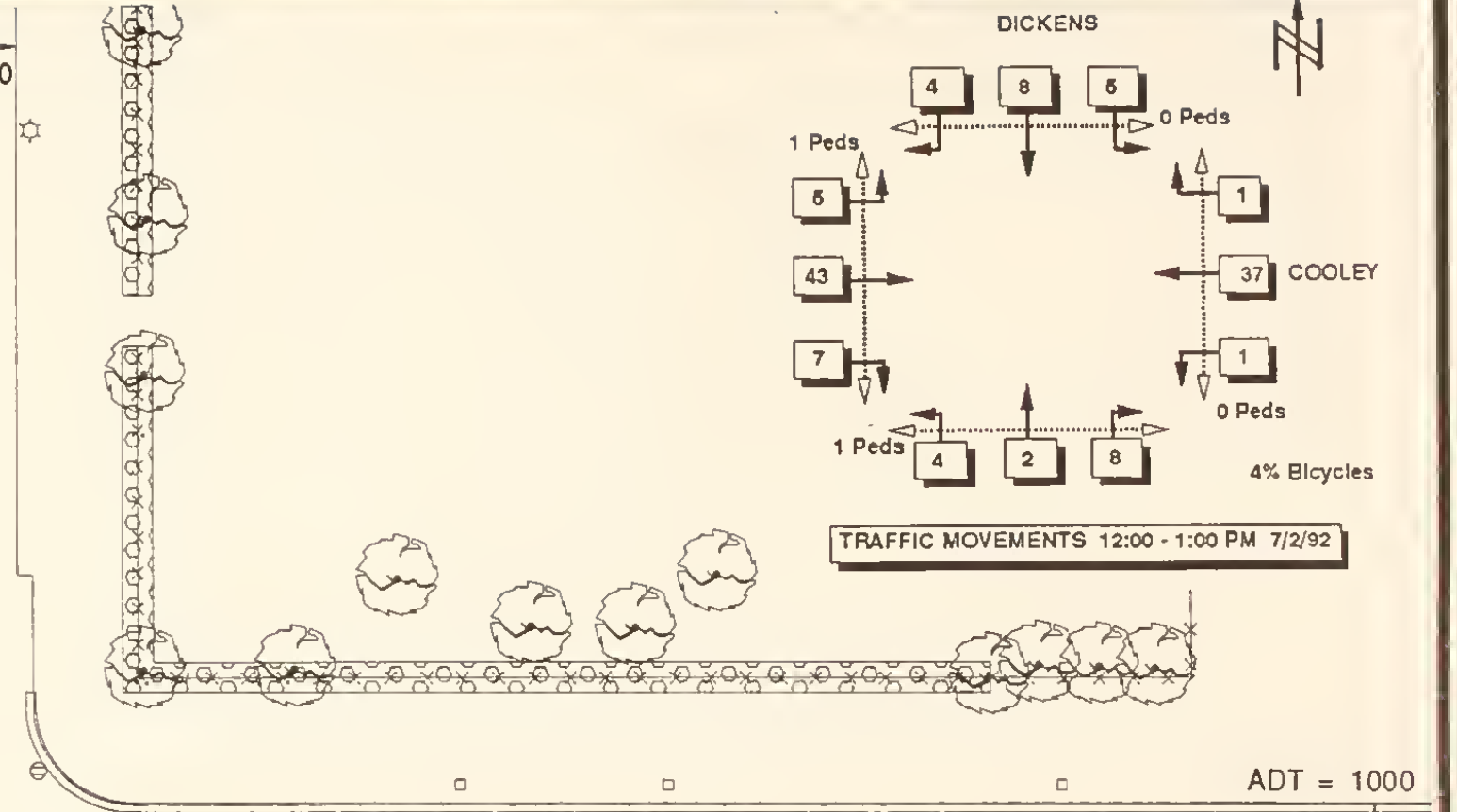
ACCIDENT STATISTICS

NO.	ACC.	YEAR
0	1988	#INJ ACC
1	1989	#FAT ACC
4	1990	#PDO ACC
1	1991	PERSON
5	TOTAL	NIGHTTIME

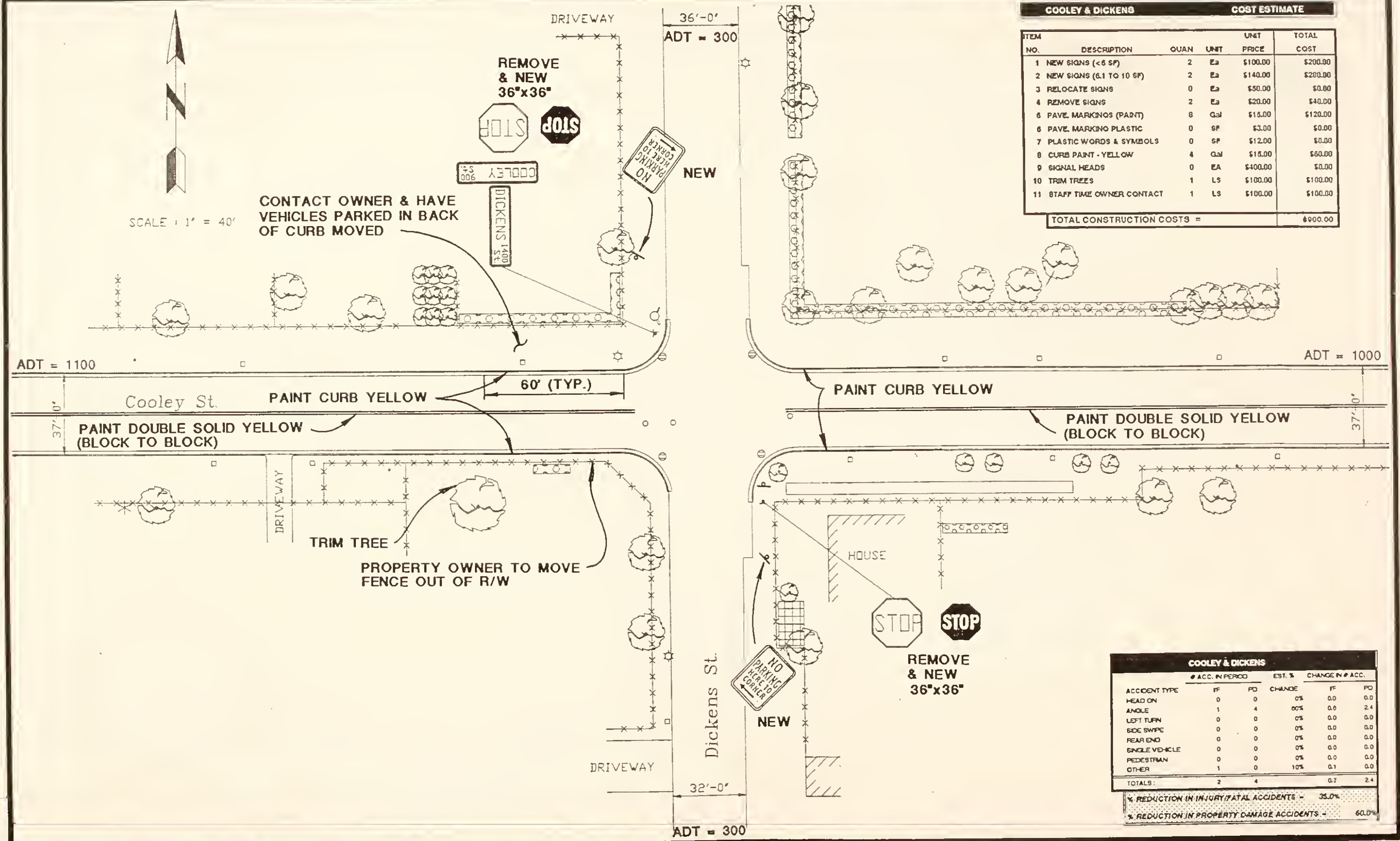
TYPES	NUMBER	ROAD
ANGLE	5	DRY
REAR END	0	WET
SIDESWIPE	0	SNOW
LEFT TRN	0	ICE
OTHER	1	OTHER

* No. of Persons Injured

36'-0"
ADT = 300



SCALE: 1" = 40'



COOLEY & DICKENS COST ESTIMATE

ITEM NO.	DESCRIPTION	QUAN	UNIT	PRICE	TOTAL COST
1	NEW SIGNS (< 6 SF)	2	Ea	\$100.00	\$200.00
2	NEW SIGNS (6.1 TO 10 SF)	2	Ea	\$140.00	\$280.00
3	RELOCATE SIGNS	0	Ea	\$50.00	\$0.00
4	REMOVE SIGNS	2	Ea	\$20.00	\$40.00
5	PAVE MARKINGS (PAINT)	8	Gal	\$15.00	\$120.00
6	PAVE MARKING PLASTIC	0	SF	\$3.00	\$0.00
7	PLASTIC WORDS & SYMBOLS	0	SF	\$12.00	\$0.00
8	CURB PAINT - YELLOW	4	Gal	\$15.00	\$60.00
9	SIGNAL HEADS	0	Ea	\$400.00	\$0.00
10	TRIM TREES	1	LS	\$100.00	\$100.00
11	STAFF TIME OWNER CONTACT	1	LS	\$100.00	\$100.00
TOTAL CONSTRUCTION COSTS =					\$900.00

COOLEY & DICKENS

ACCIDENT TYPE	# ACC. IN PERIOD		EST. % CHANGE	CHANGE IN # ACC.	
	IF	PD		IF	PD
HEAD ON	0	0	0%	0.0	0.0
ANGLE	1	4	80%	0.0	2.4
LEFT TURN	0	0	0%	0.0	0.0
SIDE SWIPE	0	0	0%	0.0	0.0
REAR END	0	0	0%	0.0	0.0
SINGLE VEHICLE	0	0	0%	0.0	0.0
PEDESTRIAN	0	0	0%	0.0	0.0
OTHER	1	0	10%	0.1	0.0
TOTALS:	2	4		0.7	2.4

% REDUCTION IN INJURY/FATAL ACCIDENTS - 35.0%

% REDUCTION IN PROPERTY DAMAGE ACCIDENTS - 60.0%



MARVIN & ASSOCIATES
Traffic, Transportation & Civil Engineers

1127 Alderson Ave. #204
Billings, MT 59102

COOLEY & DICKENS

SHORT TERM IMPROVEMENTS

SHEET 20



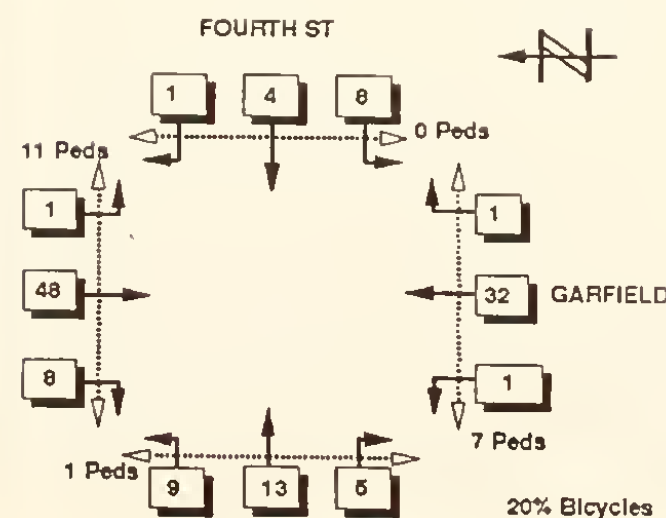
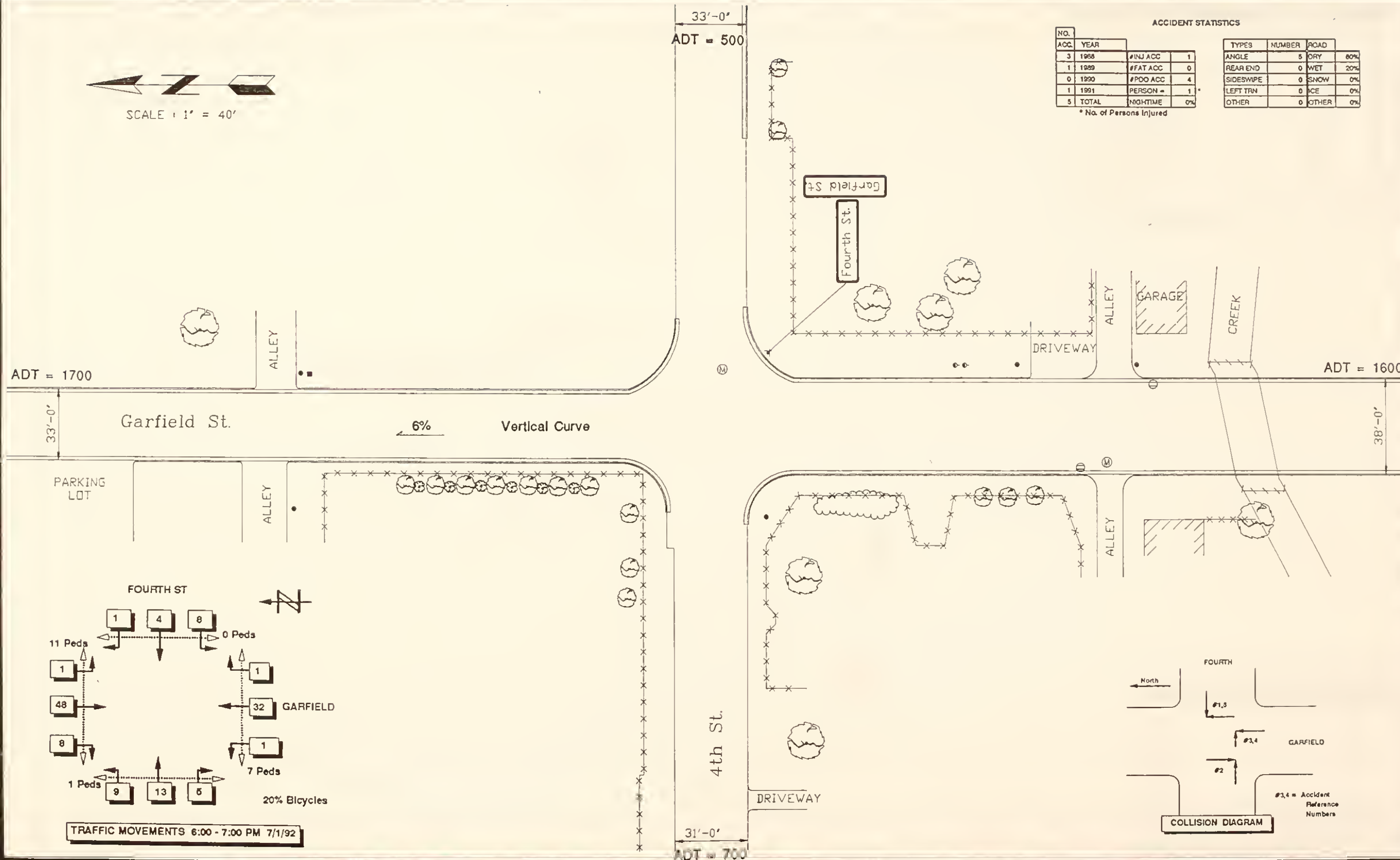
SCALE : 1" = 40'

ACCIDENT STATISTICS

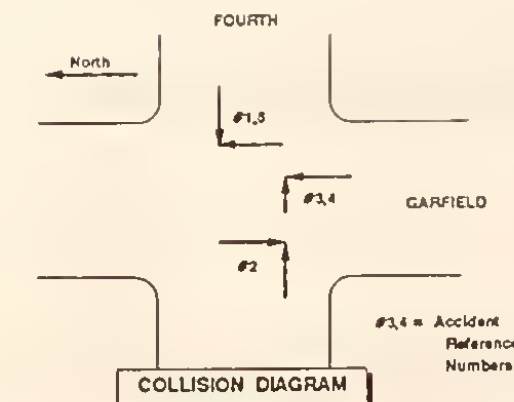
NO.	ACC.	YEAR	#INJ ACC	#FAT ACC	#PDO ACC	PERSON	NIGHTTIME
3	1988		1	0	4	1	0%
1	1989		0	0	0	0	0%
0	1990		0	0	0	0	0%
1	1991		1	0	0	1	0%
5	TOTAL		2	0	4	2	0%

* No. of Persons Injured

TYPES	NUMBER	ROAD	PERCENT
ANGLE	5	DRY	80%
REAR END	0	WET	20%
SIDESWIPE	0	SNOW	0%
LEFT TRN	0	ICE	0%
OTHER	0	OTHER	0%



TRAFFIC MOVEMENTS 6:00 - 7:00 PM 7/1/92



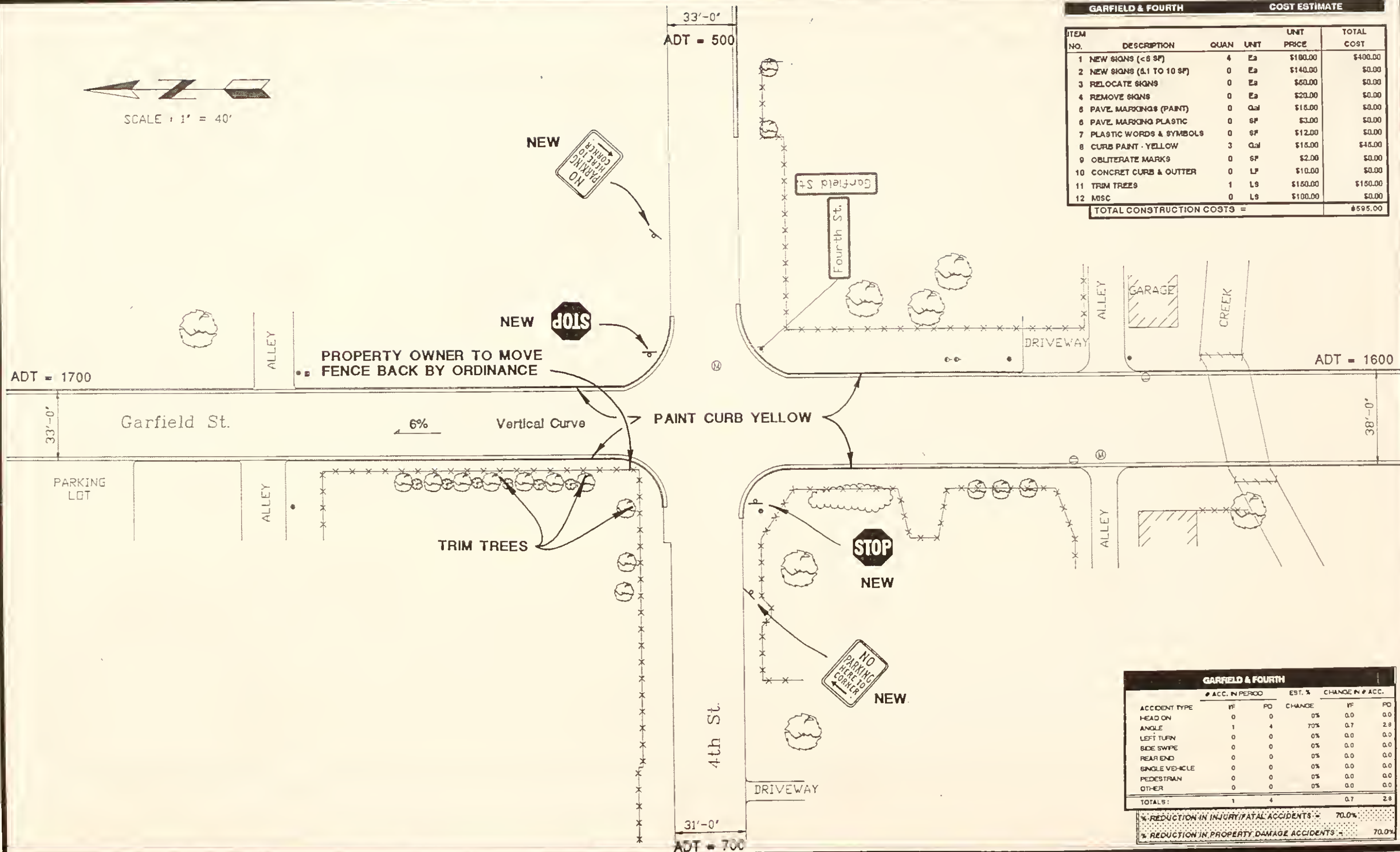
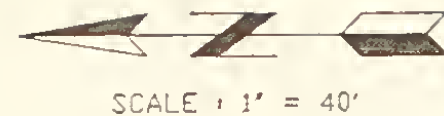
MARVIN & ASSOCIATES
Traffic, Transportation & Civil Engineers

1127 Alderson Ave. #204
Billings, MT 59102

GARFIELD & FOURTH

EXISTING CONDITIONS

**SHEET
21**



GARFIELD & FOURTH				COST ESTIMATE	
ITEM NO.	DESCRIPTION	QUAN	UNIT	PRICE	TOTAL COST
1	NEW SIGNS (< 8 SF)	4	Ea	\$100.00	\$400.00
2	NEW SIGNS (8.1 TO 10 SF)	0	Ea	\$140.00	\$0.00
3	RELOCATE SIGNS	0	Ea	\$50.00	\$0.00
4	REMOVE SIGNS	0	Ea	\$20.00	\$0.00
5	PAVE MARKINGS (PAINT)	0	Gal	\$15.00	\$0.00
6	PAVE MARKING PLASTIC	0	SF	\$3.00	\$0.00
7	PLASTIC WORDS & SYMBOLS	0	SF	\$12.00	\$0.00
8	CURB PAINT - YELLOW	3	Gal	\$15.00	\$45.00
9	OBLITERATE MARKS	0	SF	\$2.00	\$0.00
10	CONCRETE CURB & OUTER	0	LF	\$10.00	\$0.00
11	TRIM TREES	1	LS	\$150.00	\$150.00
12	MISC	0	LS	\$100.00	\$0.00
TOTAL CONSTRUCTION COSTS =					\$595.00

GARFIELD & FOURTH					
ACCIDENT TYPE	# ACC. IN PERIOD		EST. % CHANGE	CHANGE IN # ACC.	
	VF	PO		VF	PO
HEAD ON	0	0	0%	0.0	0.0
ANGLE	1	4	70%	0.7	2.8
LEFT TURN	0	0	0%	0.0	0.0
SIDE SWIPE	0	0	0%	0.0	0.0
REAR END	0	0	0%	0.0	0.0
SINGLE VEHICLE	0	0	0%	0.0	0.0
PEDESTRIAN	0	0	0%	0.0	0.0
OTHER	0	0	0%	0.0	0.0
TOTALS:	1	4		0.7	2.8
% REDUCTION IN INJURY/FATAL ACCIDENTS =				70.0%	
% REDUCTION IN PROPERTY DAMAGE ACCIDENTS =				70.0%	



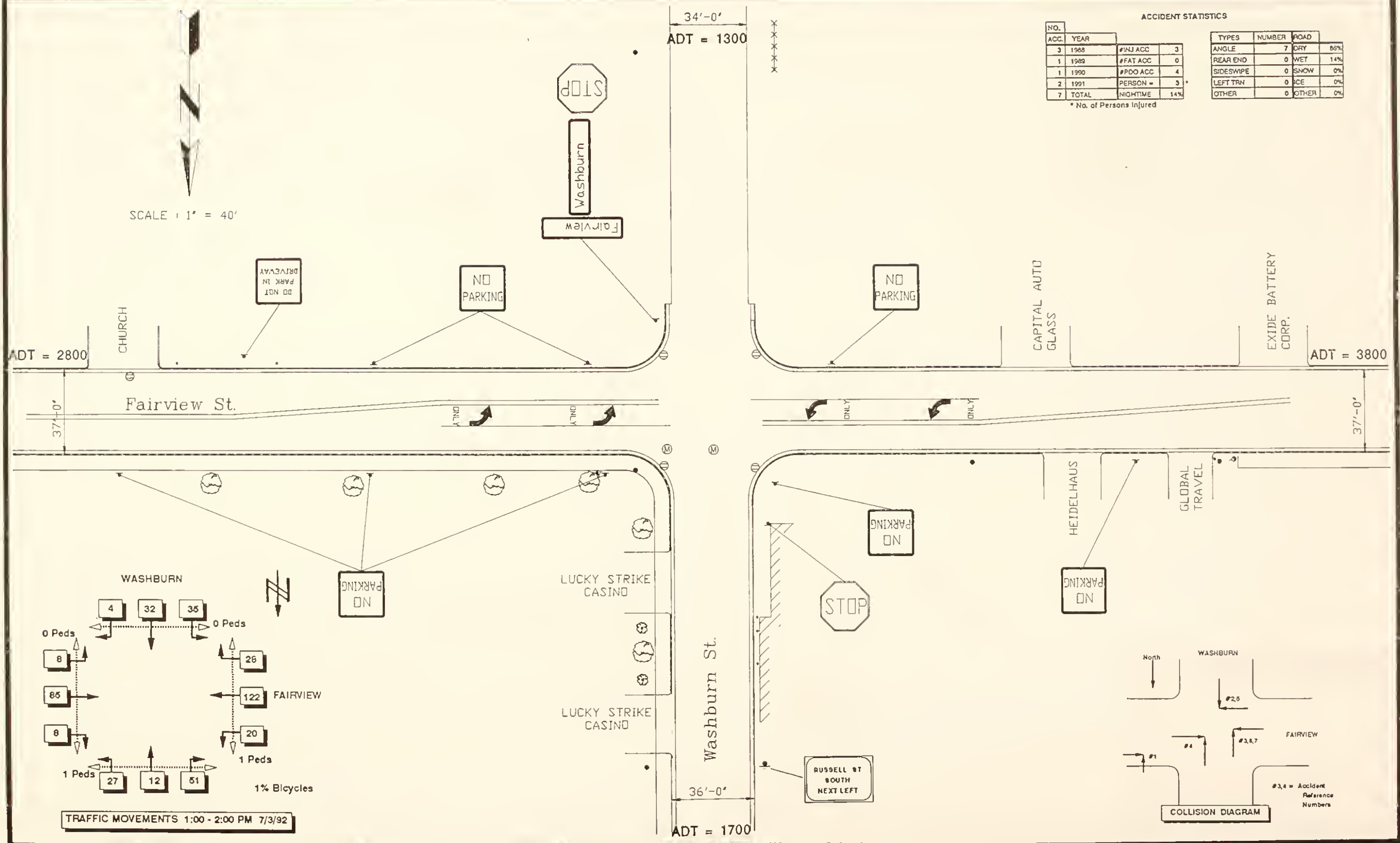
MARVIN & ASSOCIATES
Traffic, Transportation & Civil Engineers

1127 Alderson Ave. #204
Billings, MT 59102

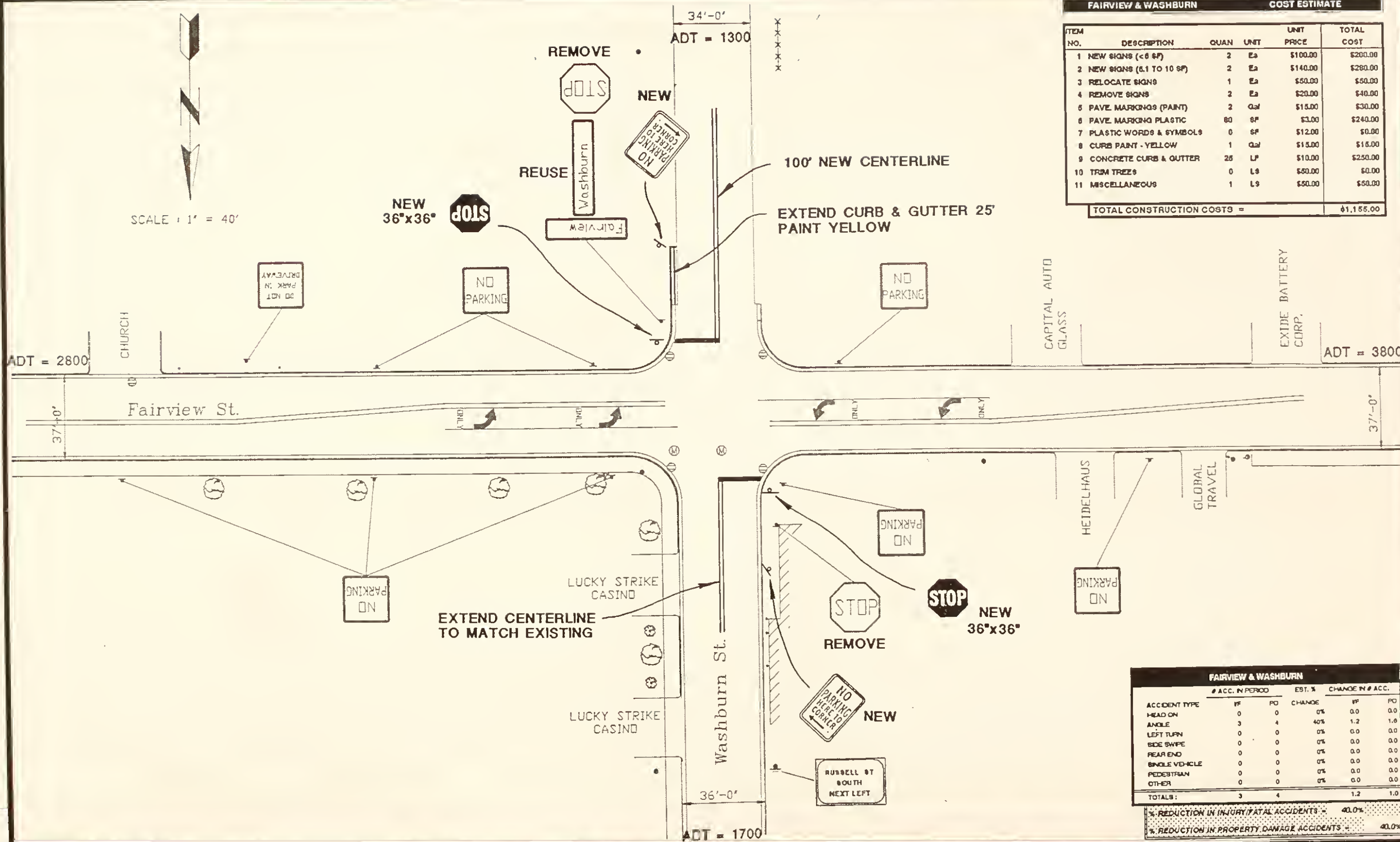
GARFIELD & FOURTH

SHORT TERM IMPROVEMENTS

**SHEET
22**



SCALE : 1" = 40'



FAIRVIEW & WASHBURN				COST ESTIMATE	
ITEM NO.	DESCRIPTION	QUAN	UNIT	PRICE	TOTAL COST
1	NEW SIGNS (< 6 SF)	2	Ea	\$100.00	\$200.00
2	NEW SIGNS (6.1 TO 10 SF)	2	Ea	\$140.00	\$280.00
3	RELOCATE SIGNS	1	Ea	\$50.00	\$50.00
4	REMOVE SIGNS	2	Ea	\$20.00	\$40.00
5	PAVE MARKINGS (PAINT)	2	Qal	\$15.00	\$30.00
6	PAVE MARKING PLASTIC	80	SF	\$3.00	\$240.00
7	PLASTIC WORDS & SYMBOLS	0	SF	\$12.00	\$0.00
8	CURB PAINT - YELLOW	1	Qal	\$15.00	\$15.00
9	CONCRETE CURB & GUTTER	25	LP	\$10.00	\$250.00
10	TRIM TREES	0	LS	\$50.00	\$0.00
11	MISCELLANEOUS	1	LS	\$50.00	\$50.00
TOTAL CONSTRUCTION COSTS =					\$1,155.00

FAIRVIEW & WASHBURN					
ACCIDENT TYPE	# ACC. IN PERIOD		EST. % CHANGE	CHANGE IN # ACC.	
	IF	PO		IF	PO
HEAD ON	0	0	0%	0.0	0.0
ANGLE	3	4	40%	1.2	1.6
LEFT TURN	0	0	0%	0.0	0.0
SIDE SWIPE	0	0	0%	0.0	0.0
REAR END	0	0	0%	0.0	0.0
SINGLE VEHICLE	0	0	0%	0.0	0.0
PEDESTRIAN	0	0	0%	0.0	0.0
OTHER	0	0	0%	0.0	0.0
TOTALS:	3	4		1.2	1.6
% REDUCTION IN INJURY/FATAL ACCIDENTS =				40.0%	
% REDUCTION IN PROPERTY DAMAGE ACCIDENTS =				40.0%	



MARVIN & ASSOCIATES

Traffic, Transportation & Civil Engineers

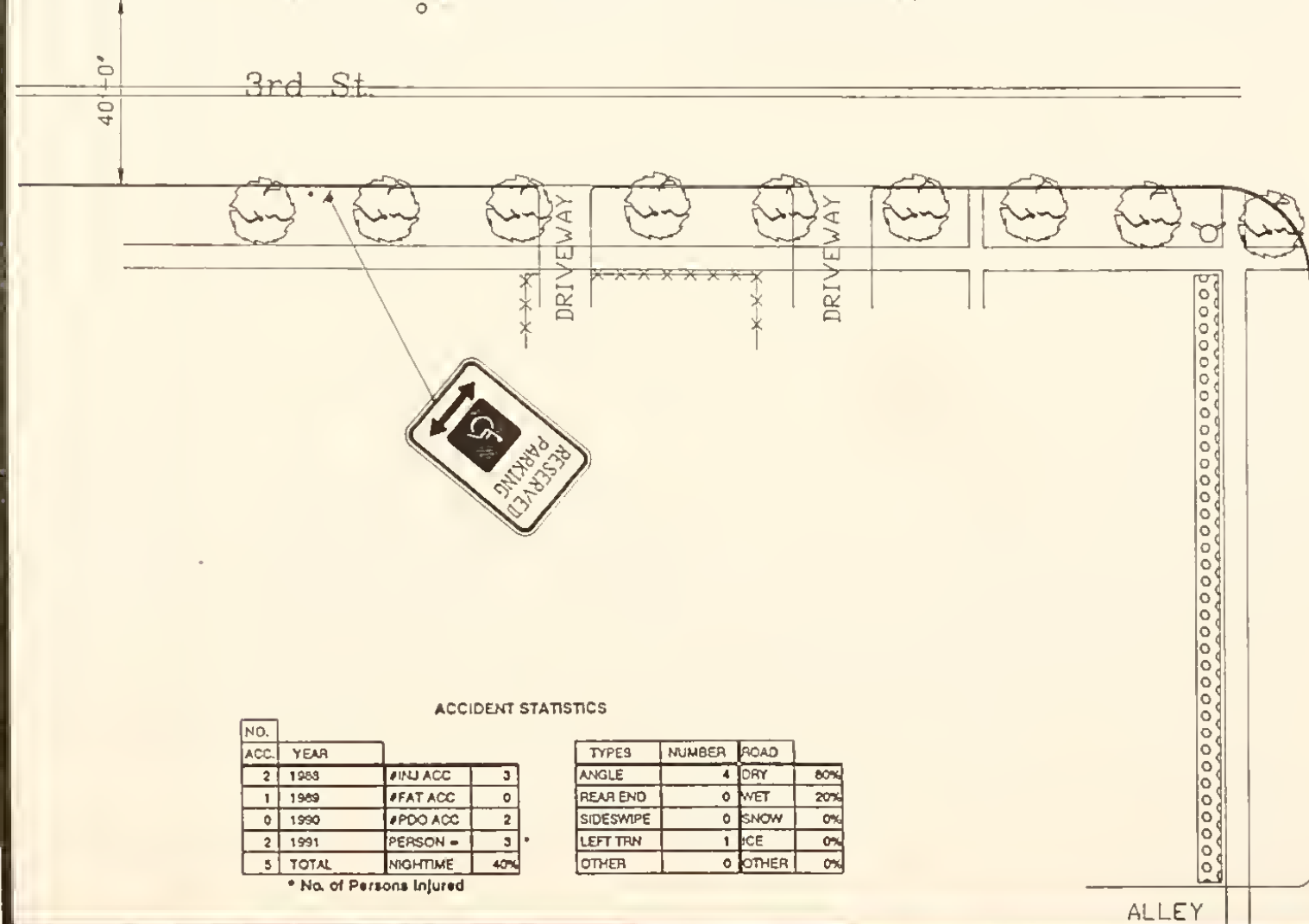
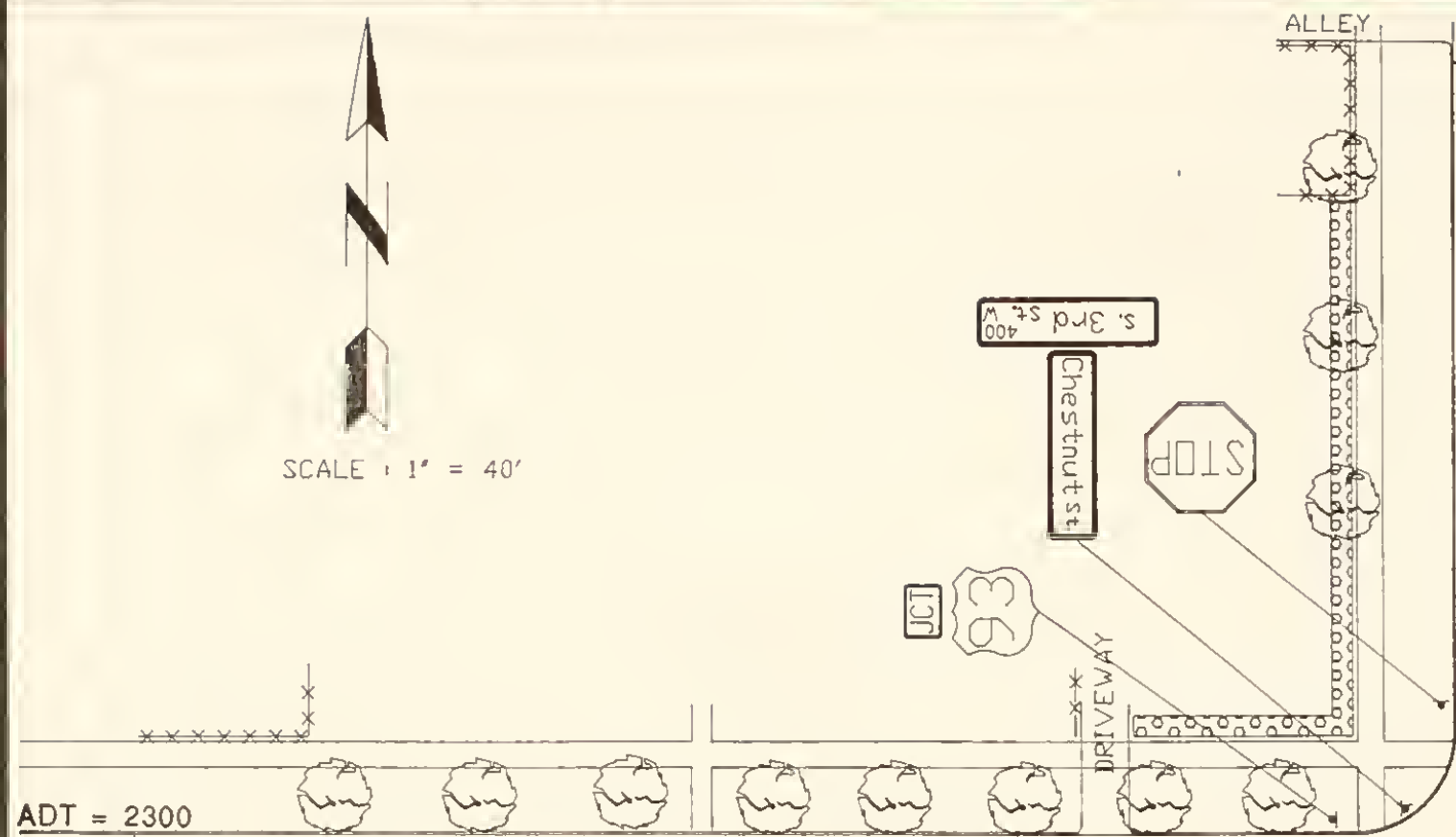
1127 Alderson Ave. #204
Billings, MT 59102

FAIRVIEW & WASHBURN

SHORT TERM IMPROVEMENTS

SHEET
24

SCALE : 1" = 40'

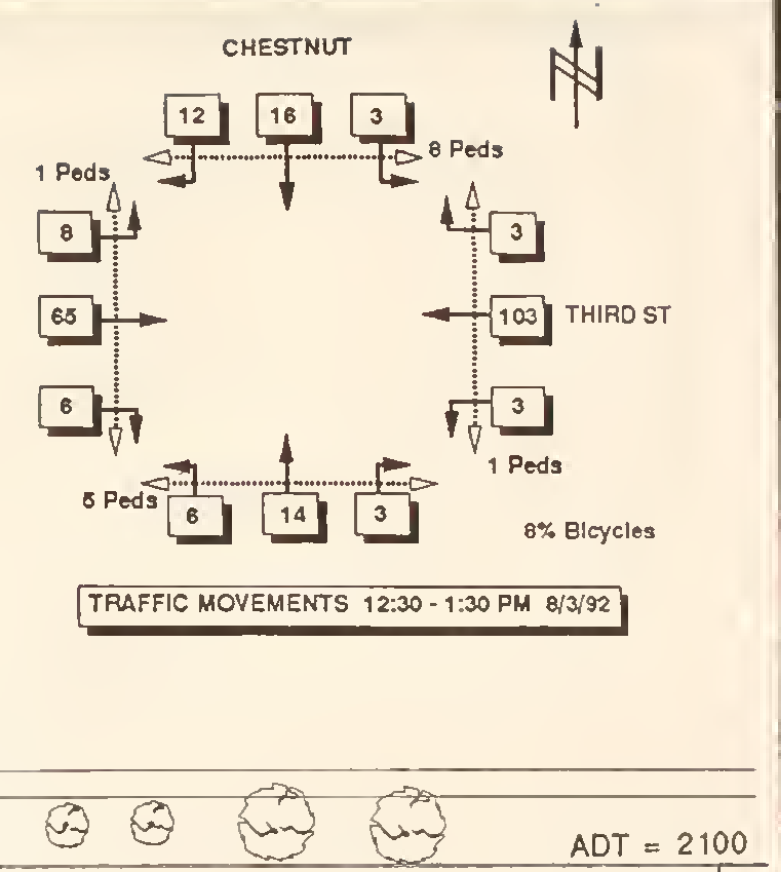
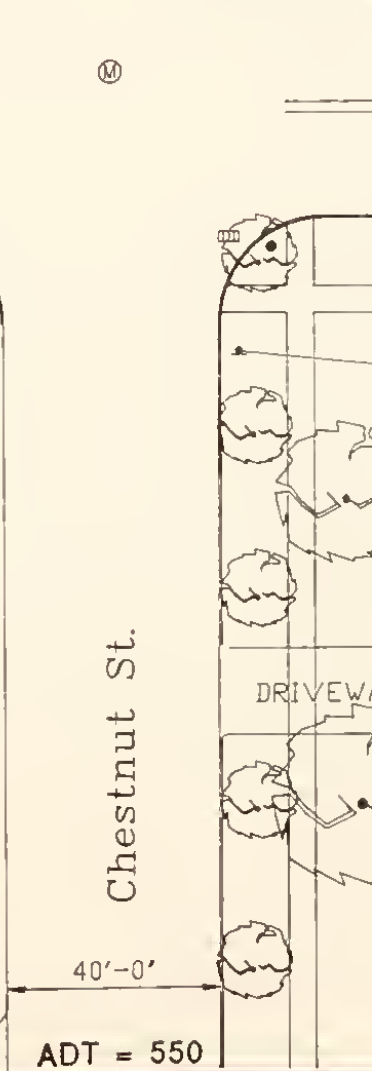
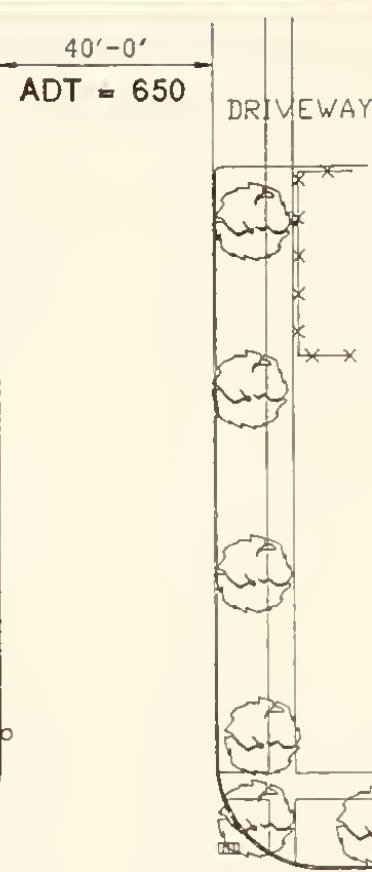


ACCIDENT STATISTICS

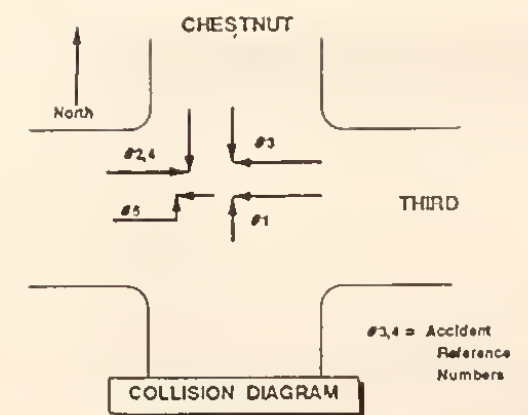
NO.	ACC.	YEAR	#INJ ACC	#FAT ACC	#PDO ACC	PERSON =	NIGHTIME
2	1983		3	0			
1	1989		0				
0	1990		2				
2	1991		3				
5	TOTAL						40%

* No. of Persons Injured

TYPES	NUMBER	ROAD	
ANGLE	4	DRY	80%
REAR END	0	WET	20%
SIDESWIPE	0	SNOW	0%
LEFT TRN	1	ICE	0%
OTHER	0	OTHER	0%



TRAFFIC MOVEMENTS 12:30 - 1:30 PM 8/3/92



#3,4 = Accident Reference Numbers



MARVIN & ASSOCIATES

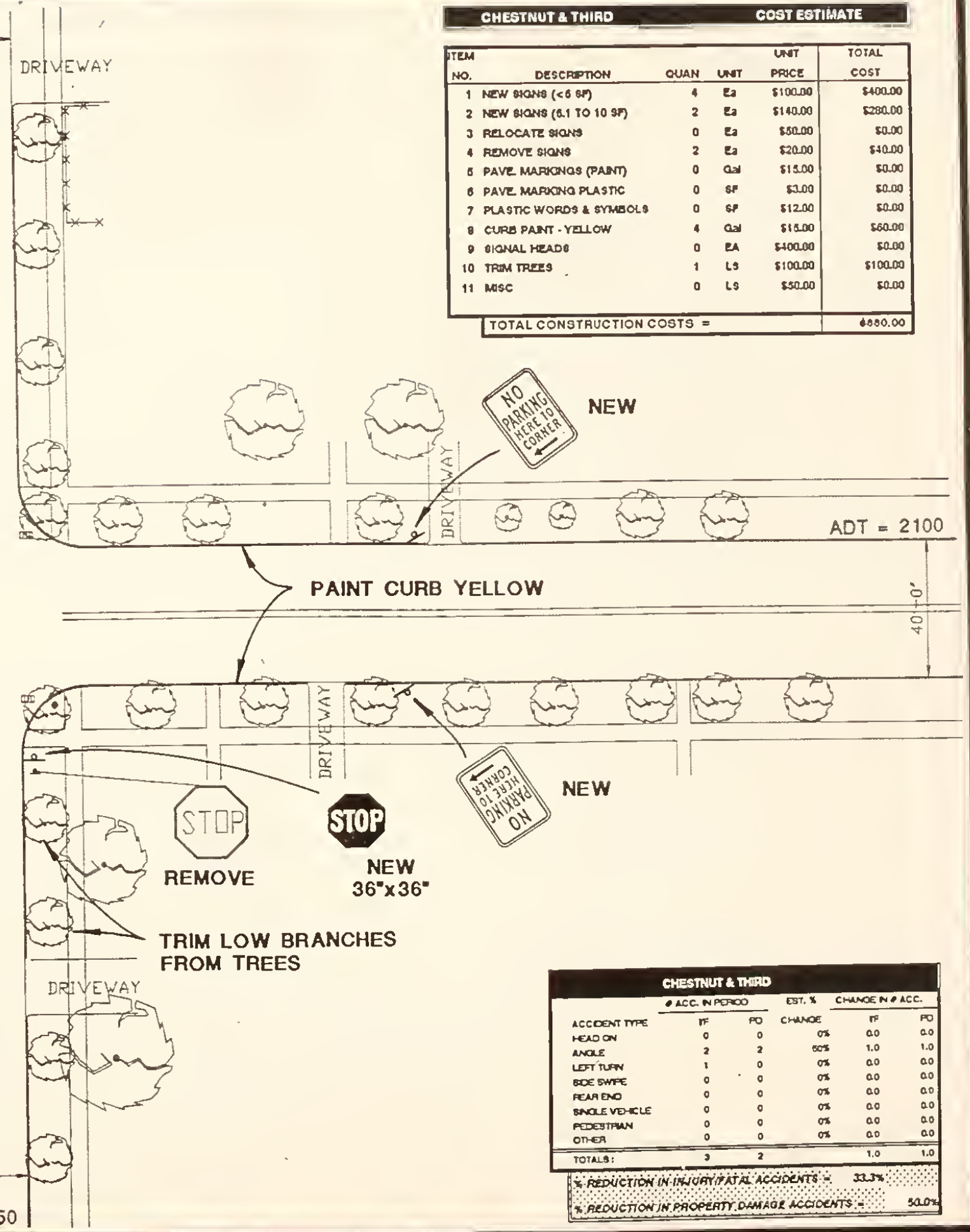
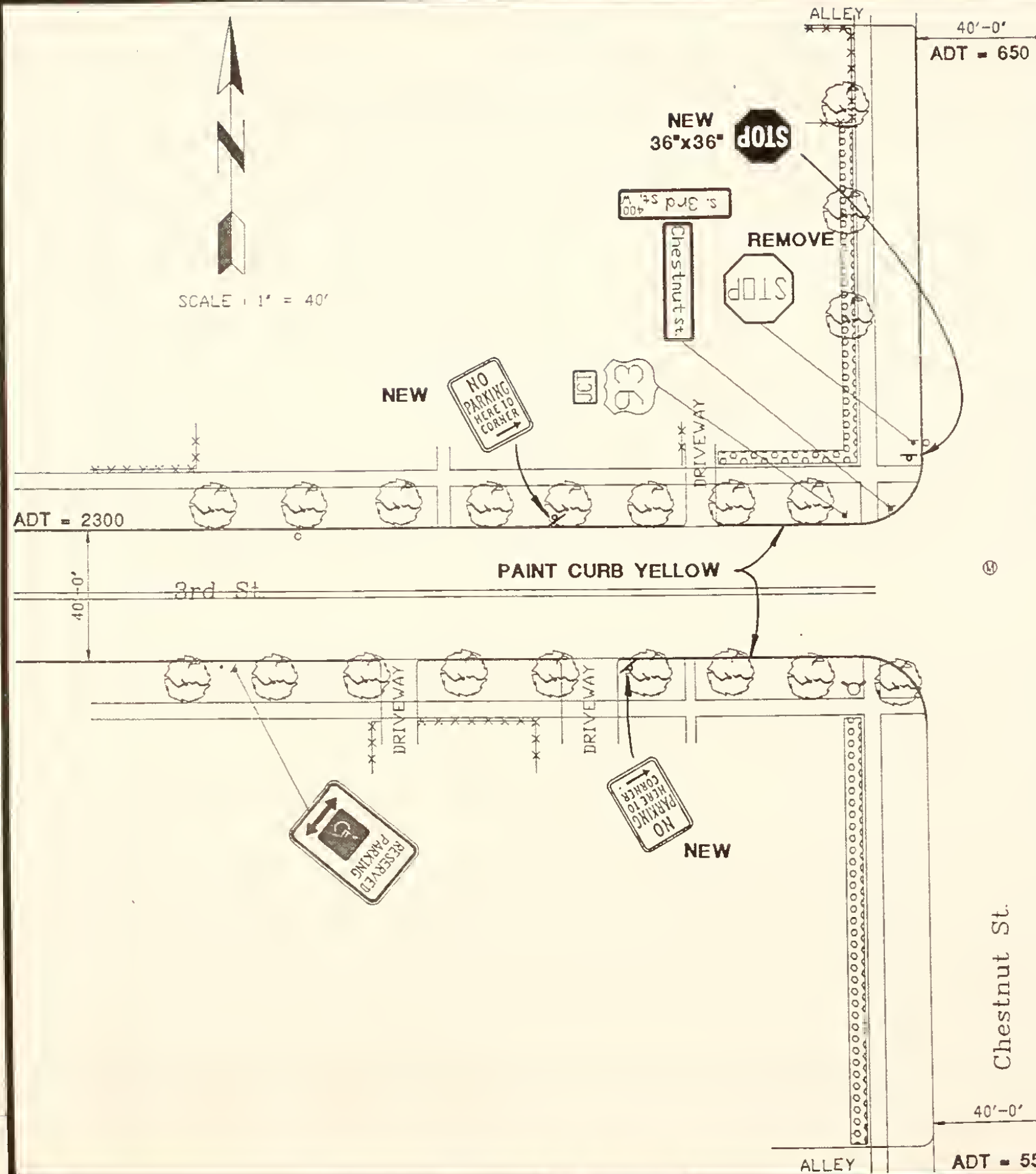
Traffic, Transportation & Civil Engineers

1127 Alderson Ave. #204
Billings, MT 59102

CHESTNUT & THIRD

EXISTING CONDITIONS

SHEET
25



CHESTNUT & THIRD					COST ESTIMATE
ITEM NO.	DESCRIPTION	QUAN	UNIT	PRICE	TOTAL COST
1	NEW SIGNS (< 6 SF)	4	EA	\$100.00	\$400.00
2	NEW SIGNS (6.1 TO 10 SF)	2	EA	\$140.00	\$280.00
3	RELOCATE SIGNS	0	EA	\$50.00	\$0.00
4	REMOVE SIGNS	2	EA	\$20.00	\$40.00
5	PAVE MARKINGS (PAINT)	0	QAL	\$15.00	\$0.00
6	PAVE MARKING PLASTIC	0	SF	\$3.00	\$0.00
7	PLASTIC WORDS & SYMBOLS	0	SF	\$12.00	\$0.00
8	CURB PAINT - YELLOW	4	QAL	\$15.00	\$60.00
9	SIGNAL HEADS	0	EA	\$400.00	\$0.00
10	TRIM TREES	1	LS	\$100.00	\$100.00
11	MISC	0	LS	\$50.00	\$0.00
TOTAL CONSTRUCTION COSTS =					\$680.00

CHESTNUT & THIRD					
ACCIDENT TYPE	# ACC. IN PERIOD		EST. % CHANGE	CHANGE IN # ACC.	
	IF	PO		IF	PO
HEAD ON	0	0	0%	0.0	0.0
ANGLE	2	2	50%	1.0	1.0
LEFT TURN	1	0	0%	0.0	0.0
SIDE SWIPE	0	0	0%	0.0	0.0
REAR END	0	0	0%	0.0	0.0
SINGLE VEHICLE	0	0	0%	0.0	0.0
PEDESTRIAN	0	0	0%	0.0	0.0
OTHER	0	0	0%	0.0	0.0
TOTALS:	3	2		1.0	1.0
% REDUCTION IN INJURY/FATAL ACCIDENTS =				33.3%	
% REDUCTION IN PROPERTY DAMAGE ACCIDENTS =				50.0%	



MARVIN & ASSOCIATES
Traffic, Transportation & Civil Engineers

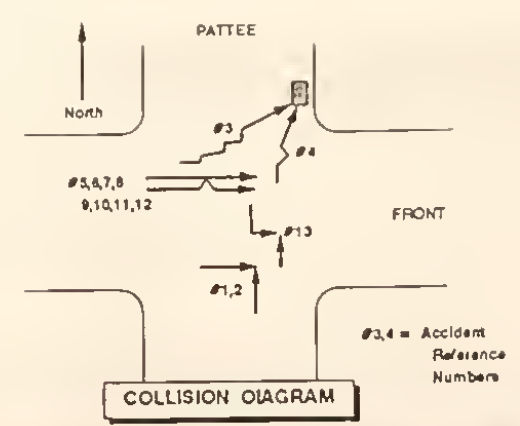
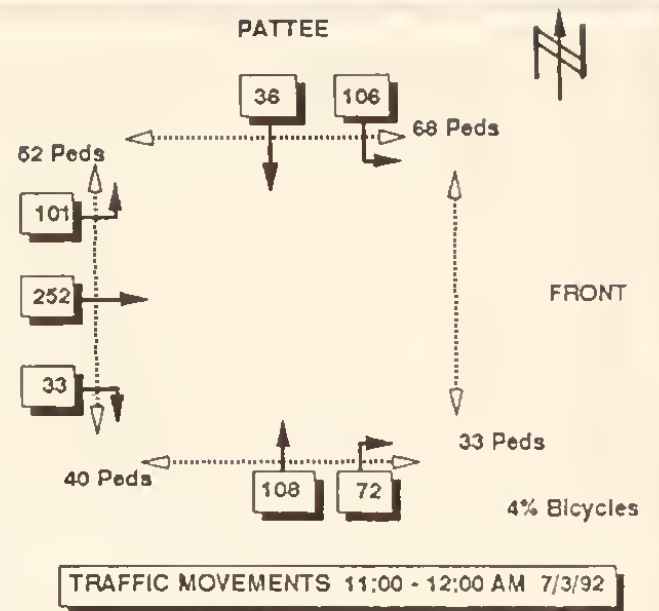
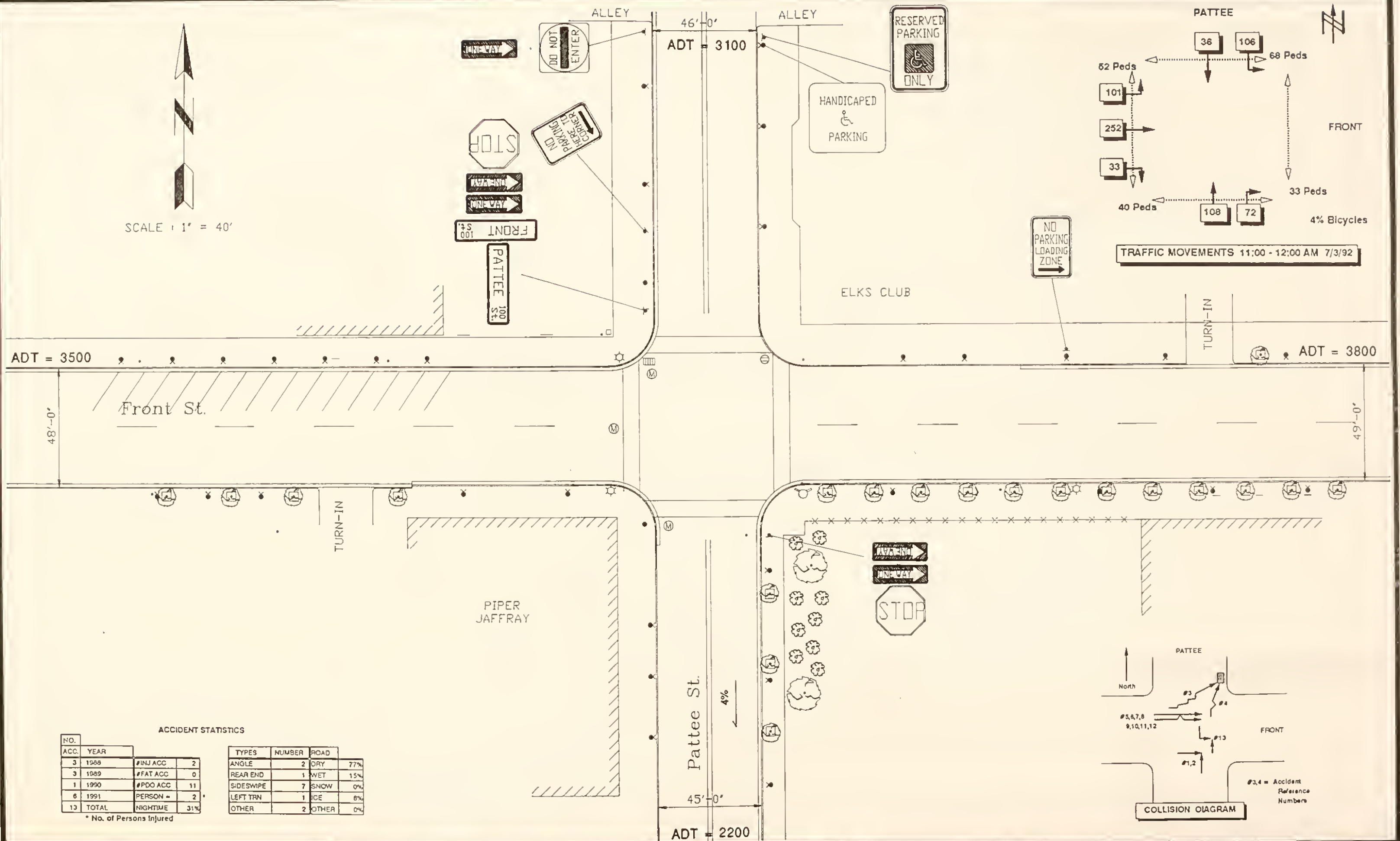
1127 Alderson Ave. #204
Billings, MT 59102

CHESTNUT & THIRD

SHORT TERM IMPROVEMENTS

SHEET
26

SCALE : 1" = 40'



ACCIDENT STATISTICS

NO.	ACC.	YEAR		
3	1988	#INJ ACC	2	
3	1989	#FAT ACC	0	
1	1990	#PDO ACC	11	
6	1991	PERSON =	2	
13	TOTAL	NIGHTTIME	31%	

* No. of Persons Injured

TYPES	NUMBER	ROAD	
ANGLE	2	DRY	77%
REAR END	1	WET	15%
SIDESWIPE	7	SNOW	0%
LEFT TRN	1	ICE	8%
OTHER	2	OTHER	0%



MARVIN & ASSOCIATES
Traffic, Transportation & Civil Engineers

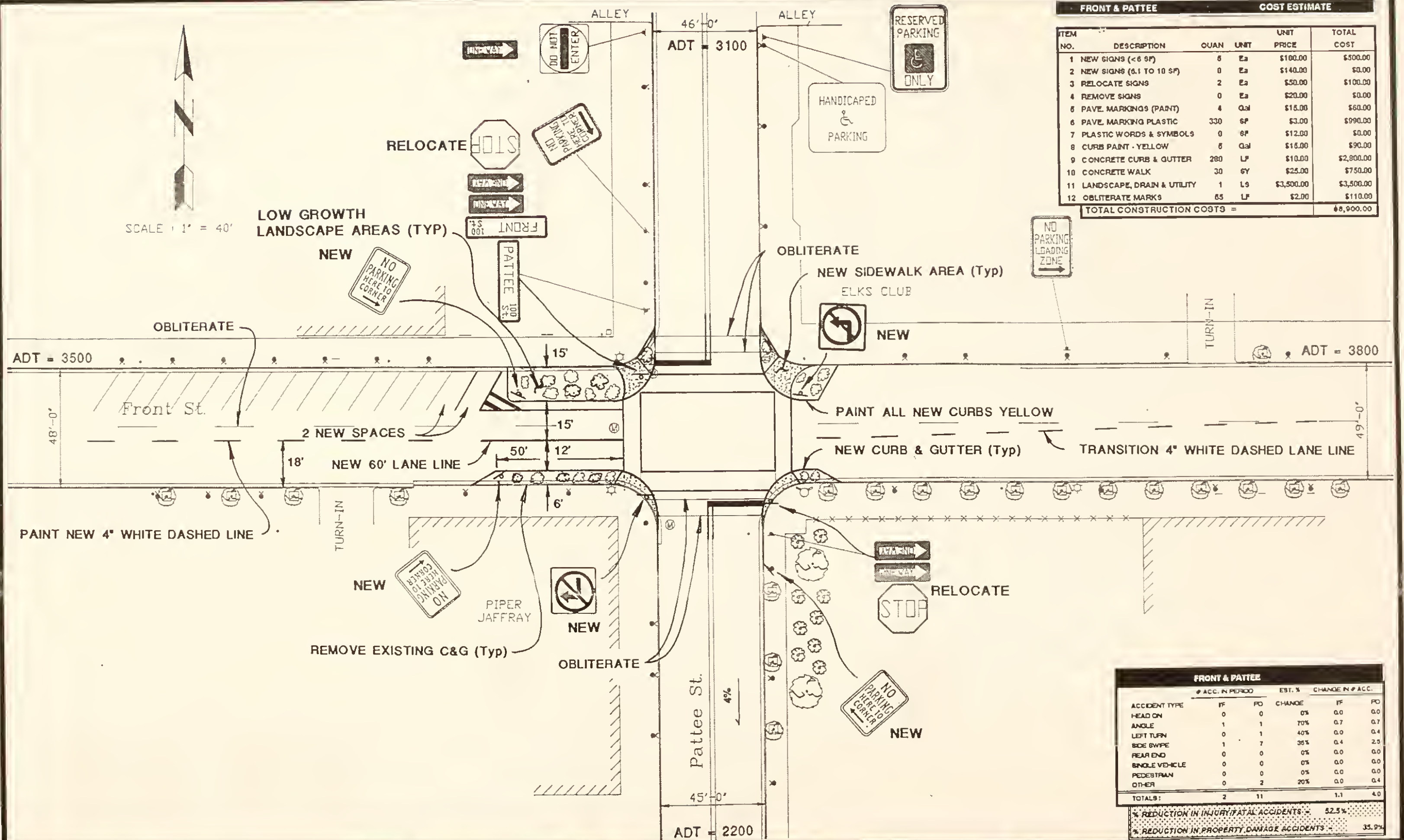
1127 Alderson Ave. #204
Billings, MT 59102

FRONT & PATTEE

EXISTING CONDITIONS

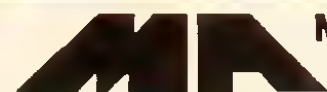
SHEET
27

SCALE: 1" = 40'



FRONT & PATTEE				COST ESTIMATE	
ITEM NO.	DESCRIPTION	QUAN	UNIT	PRICE	TOTAL COST
1	NEW SIGNS (< 6 SF)	6	Ea	\$100.00	\$600.00
2	NEW SIGNS (6.1 TO 10 SF)	0	Ea	\$140.00	\$0.00
3	RELOCATE SIGNS	2	Ea	\$50.00	\$100.00
4	REMOVE SIGNS	0	Ea	\$20.00	\$0.00
5	PAVE. MARKINGS (PAINT)	4	Gal	\$15.00	\$60.00
6	PAVE. MARKING PLASTIC	330	SF	\$3.00	\$990.00
7	PLASTIC WORDS & SYMBOLS	0	SF	\$12.00	\$0.00
8	CURB PAINT - YELLOW	6	Gal	\$15.00	\$90.00
9	CONCRETE CURB & GUTTER	280	LF	\$10.00	\$2,800.00
10	CONCRETE WALK	30	SF	\$25.00	\$750.00
11	LANDSCAPE, DRAIN & UTILITY	1	LS	\$3,500.00	\$3,500.00
12	OBLITERATE MARKS	65	LF	\$2.00	\$110.00
TOTAL CONSTRUCTION COSTS =					\$8,900.00

FRONT & PATTEE					
ACCIDENT TYPE	# ACC. IN PERIOD		EST. %	CHANGE IN # ACC.	
	IF	PD		IF	PD
HEAD ON	0	0	0%	0.0	0.0
ANGLE	1	1	70%	0.7	0.7
LEFT TURN	0	1	40%	0.0	0.4
BIDE SWIPE	1	7	35%	0.4	2.5
REAR END	0	0	0%	0.0	0.0
SINGLE VEHICLE	0	0	0%	0.0	0.0
PEDESTRIAN	0	0	0%	0.0	0.0
OTHER	0	2	20%	0.0	0.4
TOTALS:	2	11		1.1	4.0
% REDUCTION IN INJURY/FATAL ACCIDENTS -				52.5%	
% REDUCTION IN PROPERTY DAMAGE ACCIDENTS -				35.9%	



MARVIN & ASSOCIATES
Traffic, Transportation & Civil Engineers

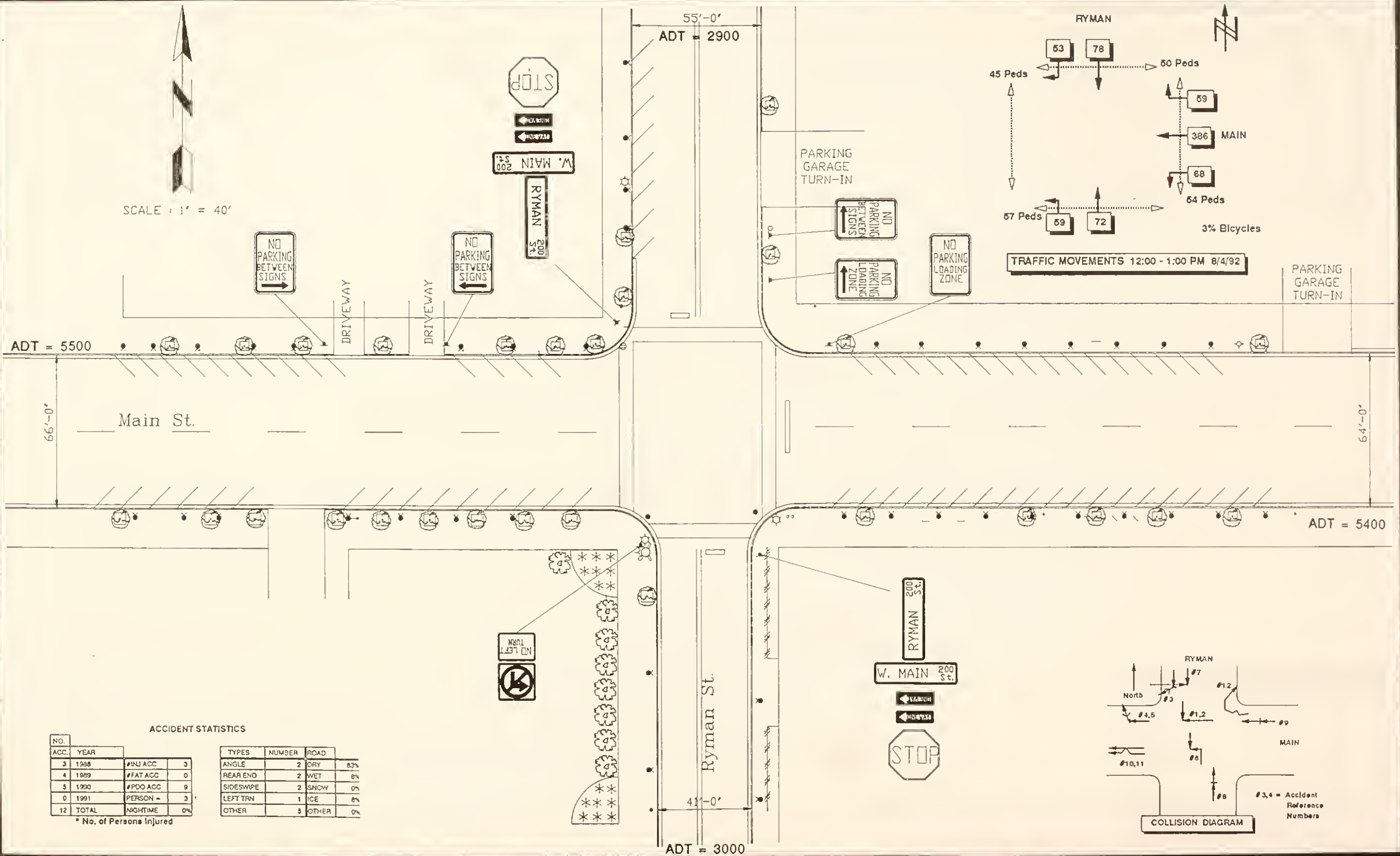
1127 Alderson Ave. #204
Billings, MT 59102

FRONT & PATTEE

SHORT TERM IMPROVEMENTS

SHEET
28

SCALE 1" = 40'



ACCIDENT STATISTICS

NO.	ACC.	YEAR		
3	1988	#INJ ACC	3	
4	1989	#FAT ACC	0	
5	1990	#PDO ACC	9	
0	1991	PERSON -	3	
12	TOTAL	NIGHTTIME	0%	

* No. of Persons Injured

TYPES	NUMBER	ROAD	
ANGLE	2	DRY	63%
REAR END	2	WET	8%
SIDESWIPE	2	SNOW	0%
LEFT TRN	1	ICE	8%
OTHER	5	OTHER	0%



MARVIN & ASSOCIATES

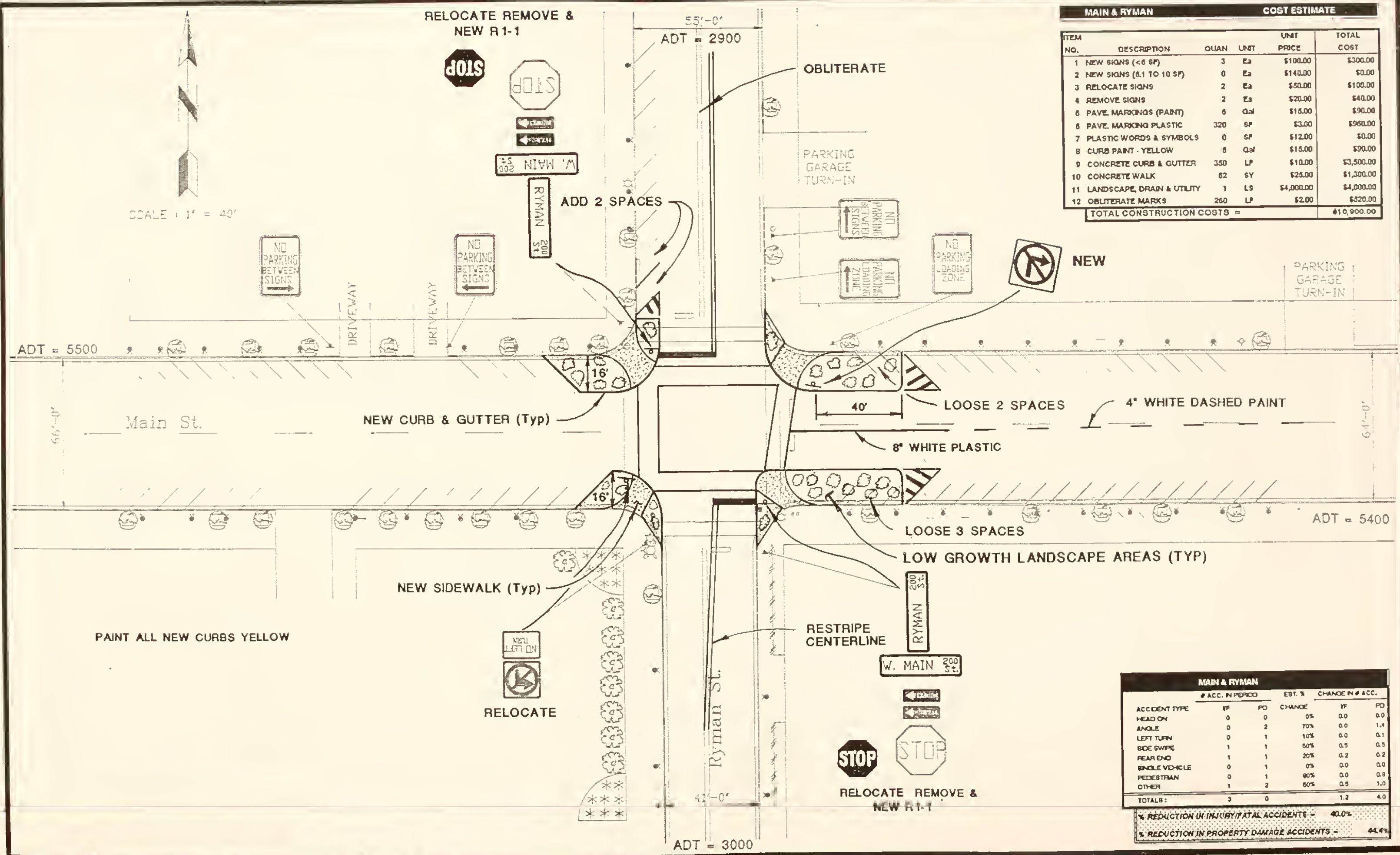
Traffic, Transportation & Civil Engineers

1127 Alderson Ave. #204
Billings, MT 59102

MAIN & RYMAN

EXISTING CONDITIONS

SHEET
29



MAIN & RYMAN				COST ESTIMATE	
ITEM NO.	DESCRIPTION	QUAN	UNIT	UNIT PRICE	TOTAL COST
1	NEW SIGNS (<6 SF)	3	Ea	\$100.00	\$300.00
2	NEW SIGNS (6.1 TO 10 SF)	0	Ea	\$140.00	\$0.00
3	RELOCATE SIGNS	2	Ea	\$50.00	\$100.00
4	REMOVE SIGNS	2	Ea	\$20.00	\$40.00
5	PAVE. MARKINGS (PAINT)	6	Qal	\$15.00	\$90.00
6	PAVE. MARKING PLASTIC	320	SF	\$3.00	\$960.00
7	PLASTIC WORDS & SYMBOLS	0	SF	\$12.00	\$0.00
8	CURB PAINT - YELLOW	6	Qal	\$15.00	\$90.00
9	CONCRETE CURB & GUTTER	350	LP	\$10.00	\$3,500.00
10	CONCRETE WALK	62	SY	\$25.00	\$1,550.00
11	LANDSCAPE, DRAIN & UTILITY	1	LS	\$4,000.00	\$4,000.00
12	OBLITERATE MARKS	260	LP	\$2.00	\$520.00
TOTAL CONSTRUCTION COSTS =					\$10,900.00

MAIN & RYMAN					
ACCIDENT TYPE	# ACC. IN PERIOD		EST. %	CHANGE IN # ACC.	
	IF	PD		IF	PD
HEAD ON	0	0	0%	0.0	0.0
ANGLE	0	2	70%	0.0	1.4
LEFT TURN	0	1	10%	0.0	0.1
SIDE SWIPE	1	1	60%	0.5	0.5
REAR END	1	1	20%	0.2	0.2
SINGLE VEHICLE	0	1	0%	0.0	0.0
PEDESTRIAN	0	1	90%	0.0	0.9
OTHER	1	2	60%	0.5	1.0
TOTALS:	3	0		1.2	4.0
% REDUCTION IN INJURY/FATAL ACCIDENTS =				40.0%	
% REDUCTION IN PROPERTY DAMAGE ACCIDENTS =				44.4%	



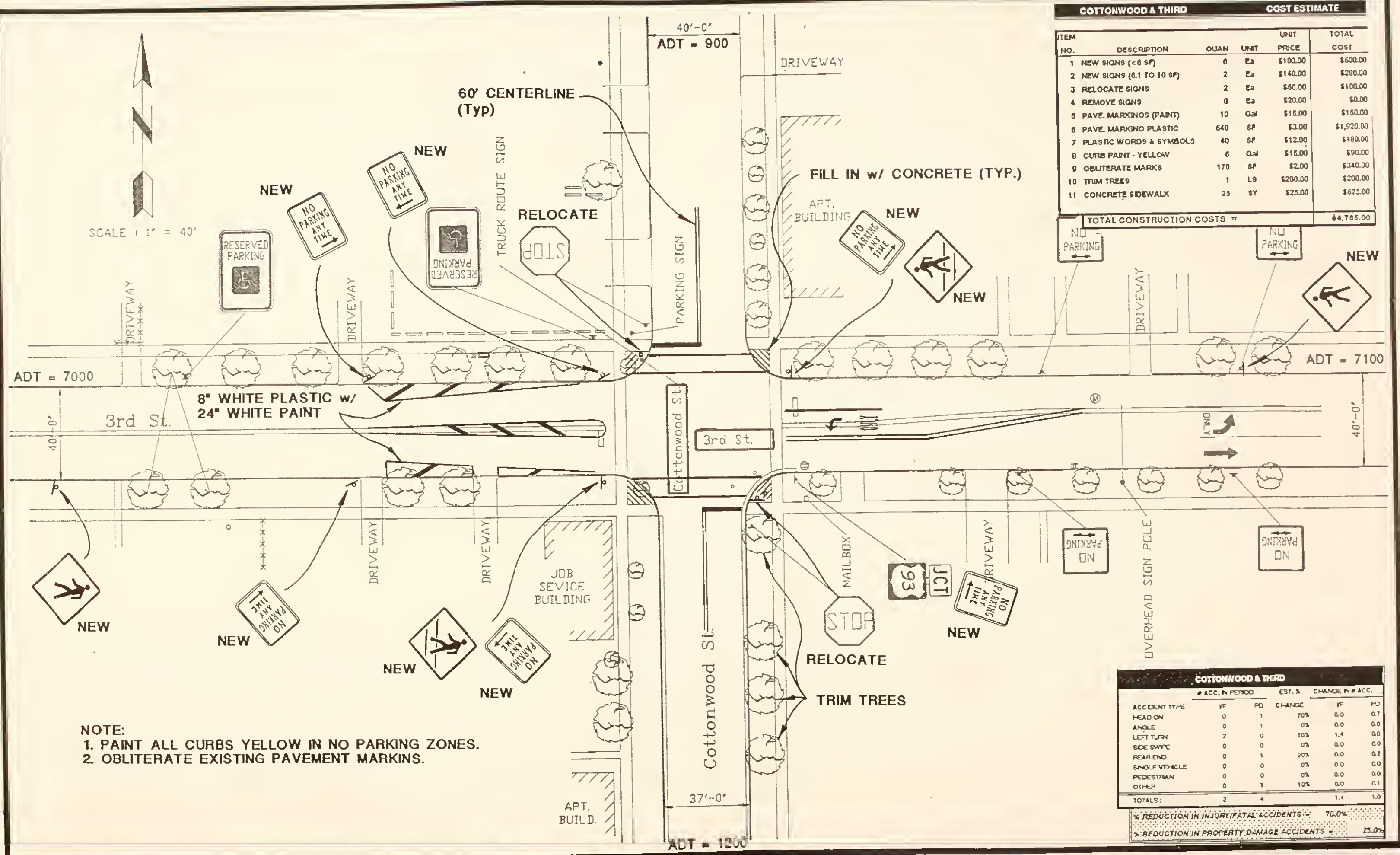
MARVIN & ASSOCIATES
Traffic, Transportation & Civil Engineers

1127 Alderson Ave. #204
Billings, MT 59102

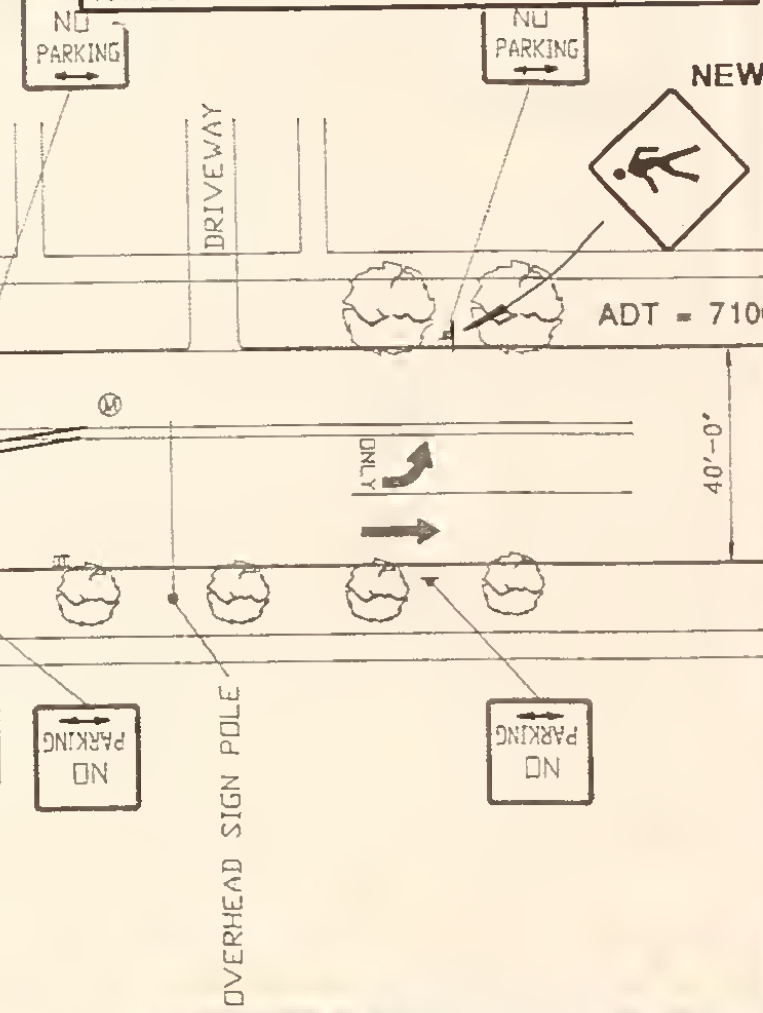
MAIN & RYMAN

SHORT TERM IMPROVEMENTS

**SHEET
30**



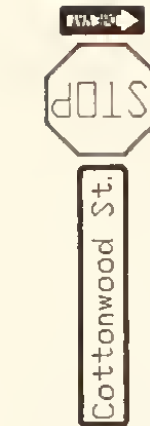
COTTONWOOD & THIRD					COST ESTIMATE	
ITEM NO.	DESCRIPTION	QUAN	UNIT	PRICE	TOTAL COST	
1	NEW SIGNS (< 6 SF)	6	Ea	\$100.00	\$600.00	
2	NEW SIGNS (6.1 TO 10 SF)	2	Ea	\$140.00	\$280.00	
3	RELOCATE SIGNS	2	Ea	\$50.00	\$100.00	
4	REMOVE SIGNS	0	Ea	\$20.00	\$0.00	
5	PAVE MARKINGS (PAINT)	10	Gal	\$16.00	\$160.00	
6	PAVE MARKING PLASTIC	640	SF	\$3.00	\$1,920.00	
7	PLASTIC WORDS & SYMBOLS	40	SF	\$12.00	\$480.00	
8	CURB PAINT - YELLOW	6	Gal	\$15.00	\$90.00	
9	OBLITERATE MARKS	170	SF	\$2.00	\$340.00	
10	TRIM TREES	1	LS	\$200.00	\$200.00	
11	CONCRETE SIDEWALK	25	SY	\$25.00	\$625.00	
TOTAL CONSTRUCTION COSTS =					\$4,785.00	



COTTONWOOD & THIRD						
ACCIDENT TYPE	IF	PD	CHANGE	IF	PD	FD
HEAD ON	0	1	70%	0.0	0.7	
ANGLE	0	1	0%	0.0	0.0	
LEFT TURN	2	0	70%	1.4	0.0	
SIDE SWIPE	0	0	0%	0.0	0.0	
REAR END	0	1	20%	0.0	0.2	
SINGLE VEHICLE	0	0	0%	0.0	0.0	
PEDESTRIAN	0	0	0%	0.0	0.0	
OTHER	0	1	10%	0.0	0.1	
TOTALS:	2	4		1.4	1.0	
% REDUCTION IN INJURY/FATAL ACCIDENTS =				70.0%		
% REDUCTION IN PROPERTY DAMAGE ACCIDENTS =				25.0%		

NOTE:
 1. PAINT ALL CURBS YELLOW IN NO PARKING ZONES.
 2. OBLITERATE EXISTING PAVEMENT MARKINGS.

SCALE : 1" = 40'

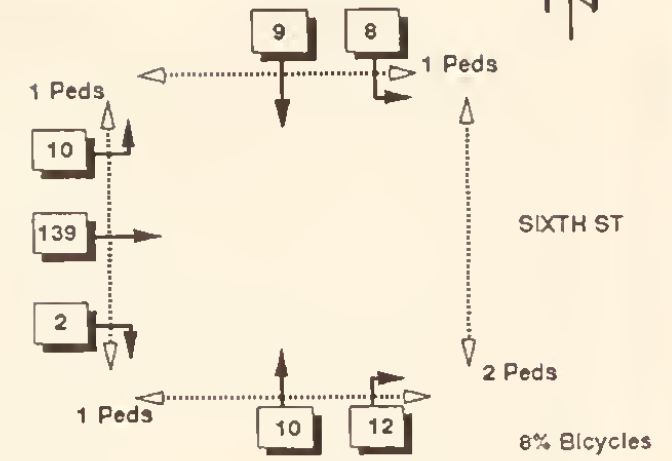


Cottonwood St.

44'-0"
ADT = 700

DRIVEWAY

COTTONWOOD



Orange Street Food Farm

ADT = 2900

27'-0"
6th St.

ADT = 2700

ALLEY

NO PARKING

Cottonwood St.

DRIVEWAY

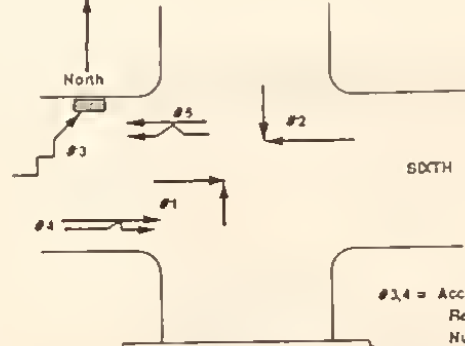
DRIVEWAY



37'-0"

ADT = 600

COTTONWOOD



#1, #2, #3, #4 = Accident Reference Numbers

ACCIDENT STATISTICS

NO.	ACC.	YEAR			
1	1988	#UNJ ACC	2	TYPES	NUMBER
1	1989	#FAT ACC	0	ANGLE	2
2	1990	#PDO ACC	3	REAR END	0
1	1991	PERSON =	2	SIDESWIPE	2
5	TOTAL	NIGHTIME	20%	LEFT TRN	0
				OTHER	1

* No. of Persons Injured

SCALE : 1" = 40'

REMOVE & NEW



ONE WAY

REUSE
NEW

Cottonwood St.

NEW LOCATION

6th St.

44'-0"
ADT = 700

DRIVEWAY

NEW



NO RT. TURN &
ONE-WAY SIGNS
HIDDEN BY TREE &
BUILDING ON
ADVANCED APP.

NEW



MOUNT ON
SIGNAL MAST

NEXT INTERSECTION EAST

ORANGE ST.

SIXTH ST.

Orange Street Food Farm

ADT = 2900

EXTEND YELLOW CURB PAINT BY 40'

6th St.

100' OF 8" WHITE PLASTIC

ADT = 2700

ALLEY



NEW

COTTONWOOD & SIXTH

COST ESTIMATE

ITEM NO.	DESCRIPTION	QUAN	UNIT	UNIT PRICE	TOTAL COST
1	NEW SIGNS (< 6 FT)	7	Ea	\$100.00	\$700.00
2	NEW SIGNS (6.1 TO 10 FT)	0	Ea	\$140.00	\$0.00
3	RELOCATE SIGNS	0	Ea	\$50.00	\$0.00
4	REMOVE SIGNS	2	Ea	\$20.00	\$40.00
5	PAVE MARKINGS (PAINT)	0	Qal	\$15.00	\$0.00
6	PAVE MARKING PLASTIC	67	SF	\$3.00	\$201.00
7	PLASTIC WORDS & SYMBOLS	0	SF	\$12.00	\$0.00
8	CURB PAINT - YELLOW	2	Qal	\$15.00	\$30.00
9	SIGNAL HEADS	0	EA	\$400.00	\$0.00
10	TRIM TREES	1	LS	\$50.00	\$50.00
11	MISC	0	LS	\$100.00	\$0.00

TOTAL CONSTRUCTION COSTS = \$1,021.00

Cottonwood St.

37'-0"

ADT = 500

DRIVEWAY

DRIVEWAY

ONE WAY

ONE WAY



NEW

REUSE

REMOVE & NEW

NEW LOCATION

TRIM LOWER TREE BRANCHES

COTTONWOOD & SIXTH

ACCIDENT TYPE	# ACC. IN PERIOD		EST. % CHANGE	CHANGE IN # ACC.	
	IF	PD		IF	PD
HEAD ON	0	0	0%	0.0	0.0
ANGLE	2	0	40%	0.8	0.0
LEFT TURN	0	0	0%	0.0	0.0
SIDE SWIPE	0	2	50%	0.0	1.0
REAR END	0	0	0%	0.0	0.0
SINGLE VEHICLE	0	0	0%	0.0	0.0
PEDESTRIAN	0	0	0%	0.0	0.0
OTHER	0	1	10%	0.0	0.1
TOTALS:	2	3		0.8	1.1

% REDUCTION IN INJURY/FATAL ACCIDENTS = 40.0%

% REDUCTION IN PROPERTY DAMAGE ACCIDENTS = 36.7%



MARVIN & ASSOCIATES

Traffic, Transportation & Civil Engineers

1127 Alderson Ave. #204
Billings, MT 59102

COTTONWOOD & SIXTH

SHORT TERM IMPROVEMENTS

SHEET
34



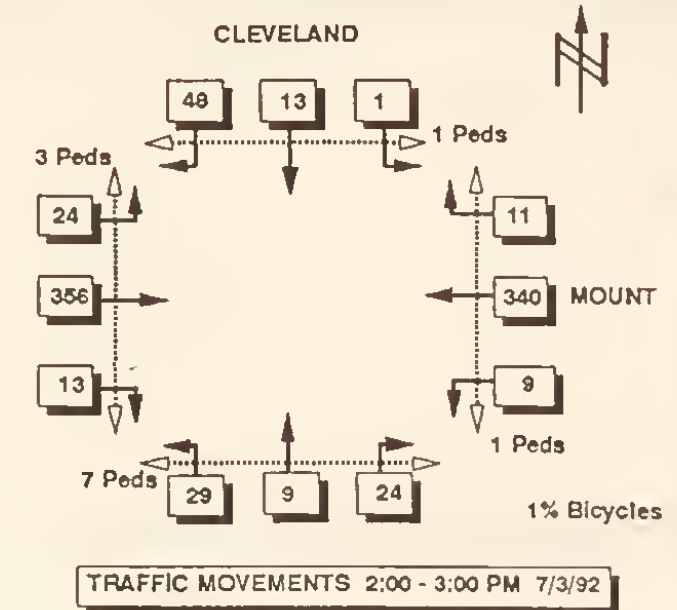
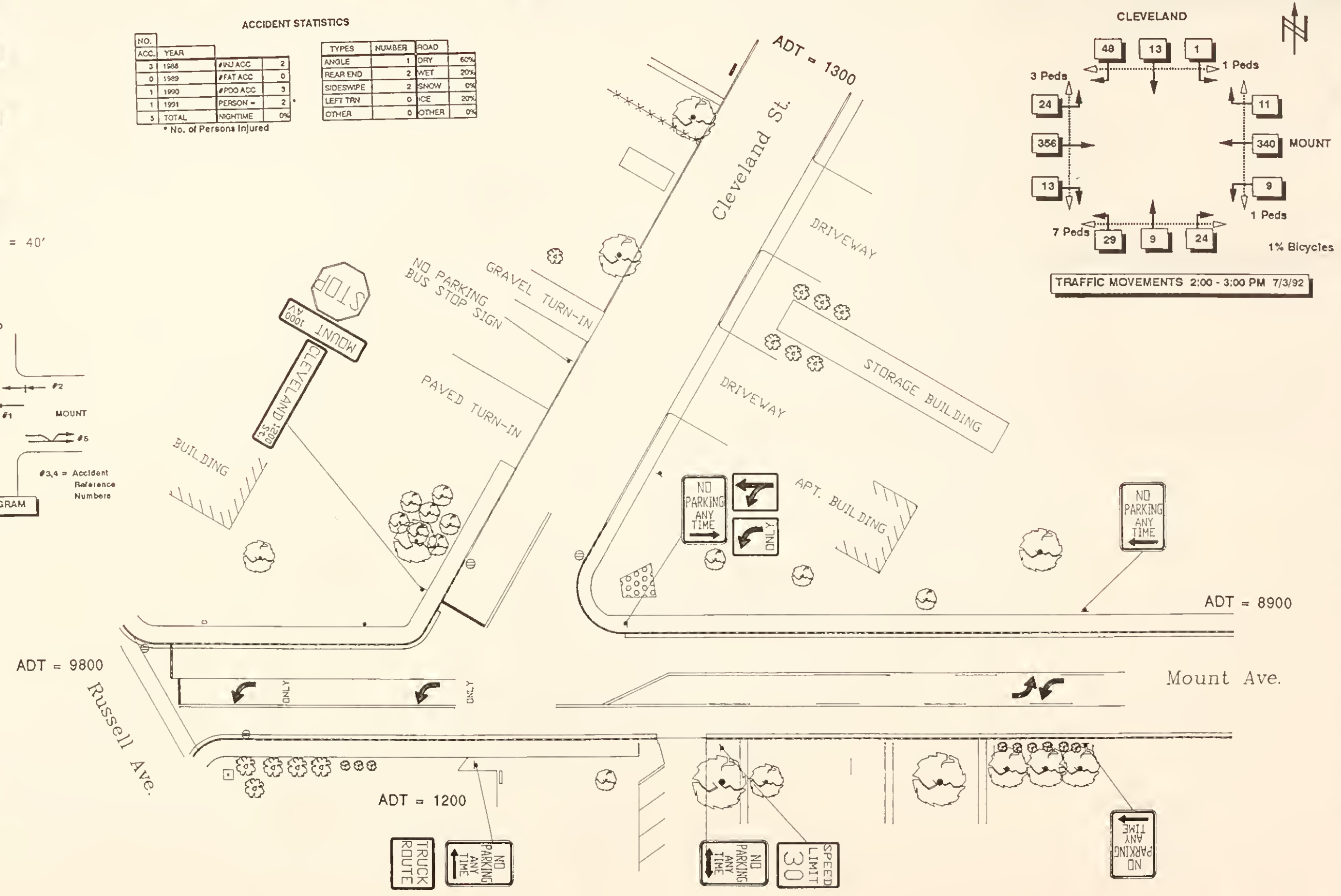
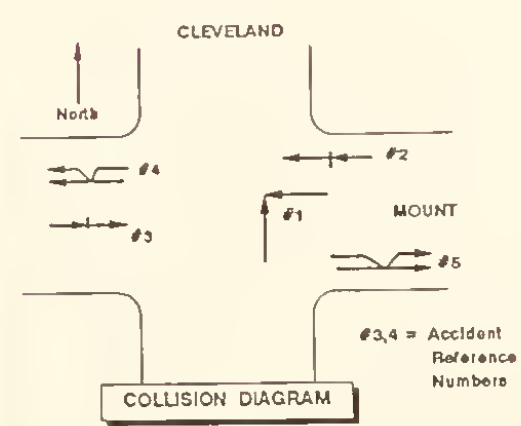
SCALE : 1" = 40'

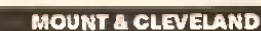
ACCIDENT STATISTICS

NO. ACC.	YEAR	#VUL ACC	#FAT ACC	#PDO ACC	PERSON =	NIGHTIME
3	1988	1	0	0	2	
0	1989	0	0	0	0	
1	1990	0	0	0	3	
1	1991	0	0	0	2	
5	TOTAL					0%

* No. of Persons Injured

TYPES	NUMBER	ROAD	
ANGLE	1	DRY	60%
REAR END	2	WET	20%
SIDESWIPE	2	SNOW	0%
LEFT TRN	0	ICE	20%
OTHER	0	OTHER	0%





COST ESTIMATE

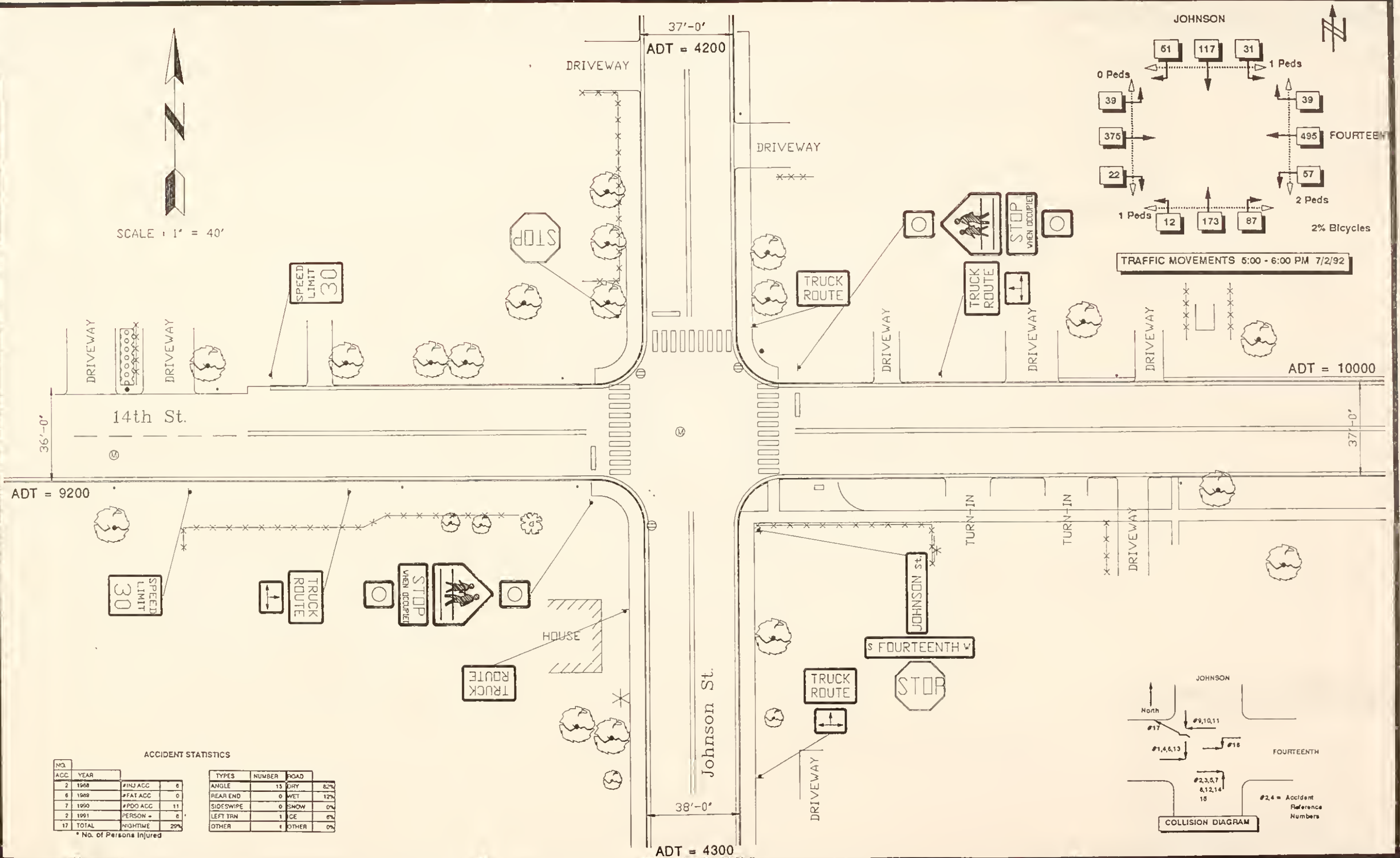
ITEM NO.	DESCRIPTION	QUAN	UNIT	UNIT PRICE	TOTAL COST
1	NEW SIGNS (<6 SF)	5	Ea	\$100.00	\$500.00
2	NEW SIGNS (6.1 TO 10 SF)	2	Ea	\$140.00	\$280.00
3	RELOCATE SIGNS	0	Ea	\$50.00	\$0.00
4	REMOVE SIGNS	0	Ea	\$20.00	\$0.00
5	PAVE MARKINGS (PAINT)	2	Gal	\$10.00	\$30.00
6	PAVE MARKING PLASTIC	250	SF	\$3.00	\$780.00
7	PLASTIC WORDS & SYMBOLS	0	SF	\$12.00	\$0.00
8	CURB PAINT - YELLOW	0	Gal	\$15.00	\$0.00
9	OBLITERATE MARKS	0	SF	\$2.00	\$0.00
10	CONCRETE CURB & GUTTER	0	LF	\$10.00	\$0.00
11	CONCRETE WALK	0	SY	\$25.00	\$0.00
12	MISC	0	LS	\$100.00	\$0.00
TOTAL CONSTRUCTION COSTS =					\$1,590.00

MOUNT & CLEVELAND

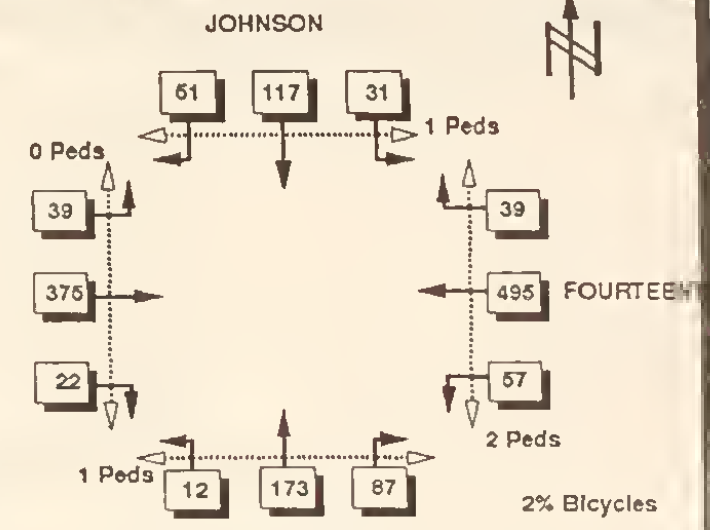
ACCIDENT TYPE	# ACC. IN PERIOD		EST. % CHANGE	CHANGE IN # ACC.	
	VF	PO		VF	PO
HEAD ON	0	0	0%	0.0	0.0
ANGLE	0	1	50%	0.0	0.0
LEFT TURN	0	0	0%	0.0	0.0
BACK SWIPE	1	1	30%	0.3	0.0
REAR END	1	1	20%	0.2	0.0
SINGLE VEHICLE	0	0	0%	0.0	0.0
PEDESTRIAN	0	0	0%	0.0	0.0
OTHER	0	0	0%	0.0	0.0
TOTALS*	2	3		0.5	0.0

% REDUCTION IN INJURY/FATAL ACCIDENTS -	23.0%
% REDUCTION IN PROPERTY DAMAGE ACCIDENTS -	33.3%

SCALE : 1" = 40'



TRAFFIC MOVEMENTS 5:00 - 6:00 PM 7/2/92

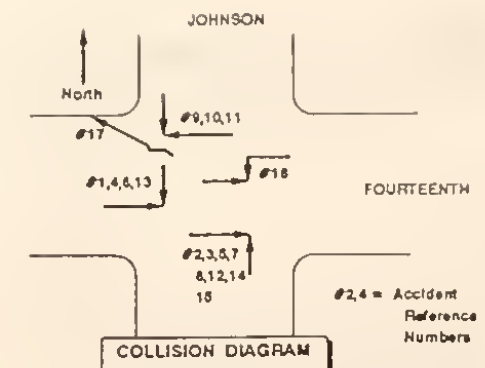


ACCIDENT STATISTICS

NO.	YEAR	#INJ ACC	#FAT ACC	#PDO ACC	PERSON	NIGHTTIME
2	1988	0	0	11	0	29%
6	1989	0	0	11	0	29%
7	1990	0	0	11	0	29%
2	1991	0	0	11	0	29%
17	TOTAL	0	0	44	0	29%

* No. of Persons Injured

TYPES	NUMBER	ROAD
ANGLE	15	DRY
REAR END	0	WET
SIDESWIPE	0	SNOW
LEFT TRN	1	ICE
OTHER	1	OTHER

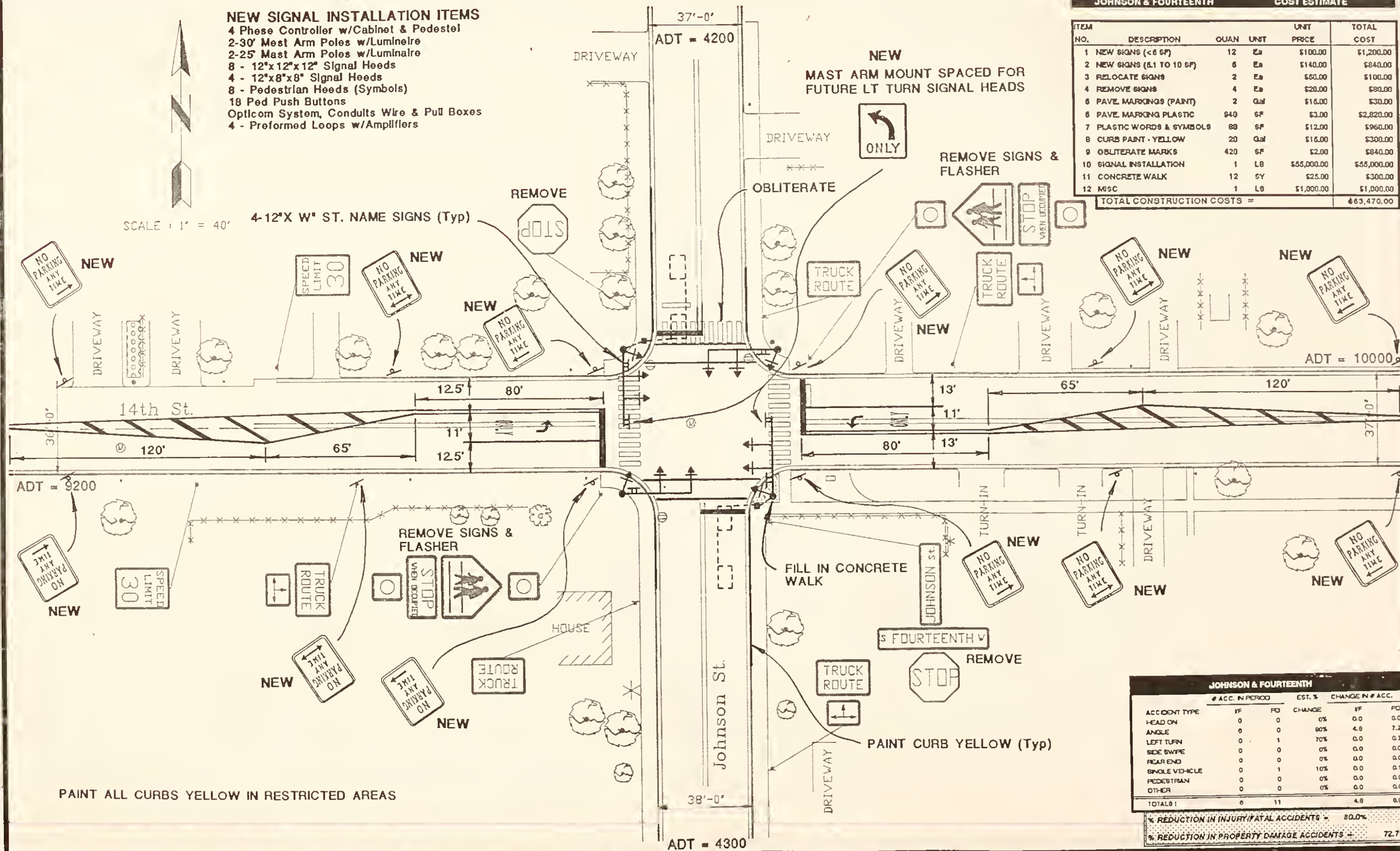


NEW SIGNAL INSTALLATION ITEMS

- 4 Phase Controller w/Cabinet & Pedestal
- 2-30' Mast Arm Poles w/Luminaire
- 2-25' Mast Arm Poles w/Luminaire
- 8 - 12"x12"x12" Signal Heads
- 4 - 12"x8"x8" Signal Heads
- 8 - Pedestrian Heads (Symbols)
- 18 Ped Push Buttons
- Opticom System, Conduits Wire & Pull Boxes
- 4 - Preformed Loops w/Amplifiers

SCALE: 1" = 40'

4-12"X W" ST. NAME SIGNS (Typ)



JOHNSON & FOURTEENTH COST ESTIMATE

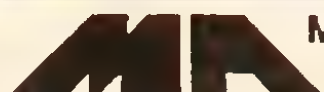
ITEM NO.	DESCRIPTION	QUAN	UNIT	PRICE	TOTAL COST
1	NEW SIGNS (< 6 SF)	12	Ea	\$100.00	\$1,200.00
2	NEW SIGNS (6.1 TO 10 SF)	6	Ea	\$140.00	\$840.00
3	RELOCATE SIGNS	2	Ea	\$50.00	\$100.00
4	REMOVE SIGNS	4	Ea	\$20.00	\$80.00
5	PAVE MARKINGS (PAINT)	2	Gal	\$15.00	\$30.00
6	PAVE MARKING PLASTIC	940	SF	\$3.00	\$2,820.00
7	PLASTIC WORDS & SYMBOLS	80	SF	\$12.00	\$960.00
8	CURB PAINT - YELLOW	20	Gal	\$15.00	\$300.00
9	OBLITERATE MARKS	420	SF	\$2.00	\$840.00
10	SIGNAL INSTALLATION	1	LS	\$55,000.00	\$55,000.00
11	CONCRETE WALK	12	SY	\$25.00	\$300.00
12	MISC	1	LS	\$1,000.00	\$1,000.00
TOTAL CONSTRUCTION COSTS =					\$63,470.00

JOHNSON & FOURTEENTH

ACCIDENT TYPE	# ACC. IN PERIOD		EST. % CHANGE	CHANGE IN # ACC.	
	IF	PD		IF	PD
HEAD ON	0	0	0%	0.0	0.0
ANGLE	0	0	00%	4.8	7.2
LEFT TURN	0	1	70%	0.0	0.7
SIDE SWIPE	0	0	0%	0.0	0.0
REAR END	0	0	0%	0.0	0.0
SINGLE VEHICLE	0	1	10%	0.0	0.1
PEDESTRIAN	0	0	0%	0.0	0.0
OTHER	0	0	0%	0.0	0.0
TOTALS:	0	11		4.8	8.0

% REDUCTION IN INJURY/FATAL ACCIDENTS = 80.0%

% REDUCTION IN PROPERTY DAMAGE ACCIDENTS = 72.7%



MARVIN & ASSOCIATES

Traffic, Transportation & Civil Engineers

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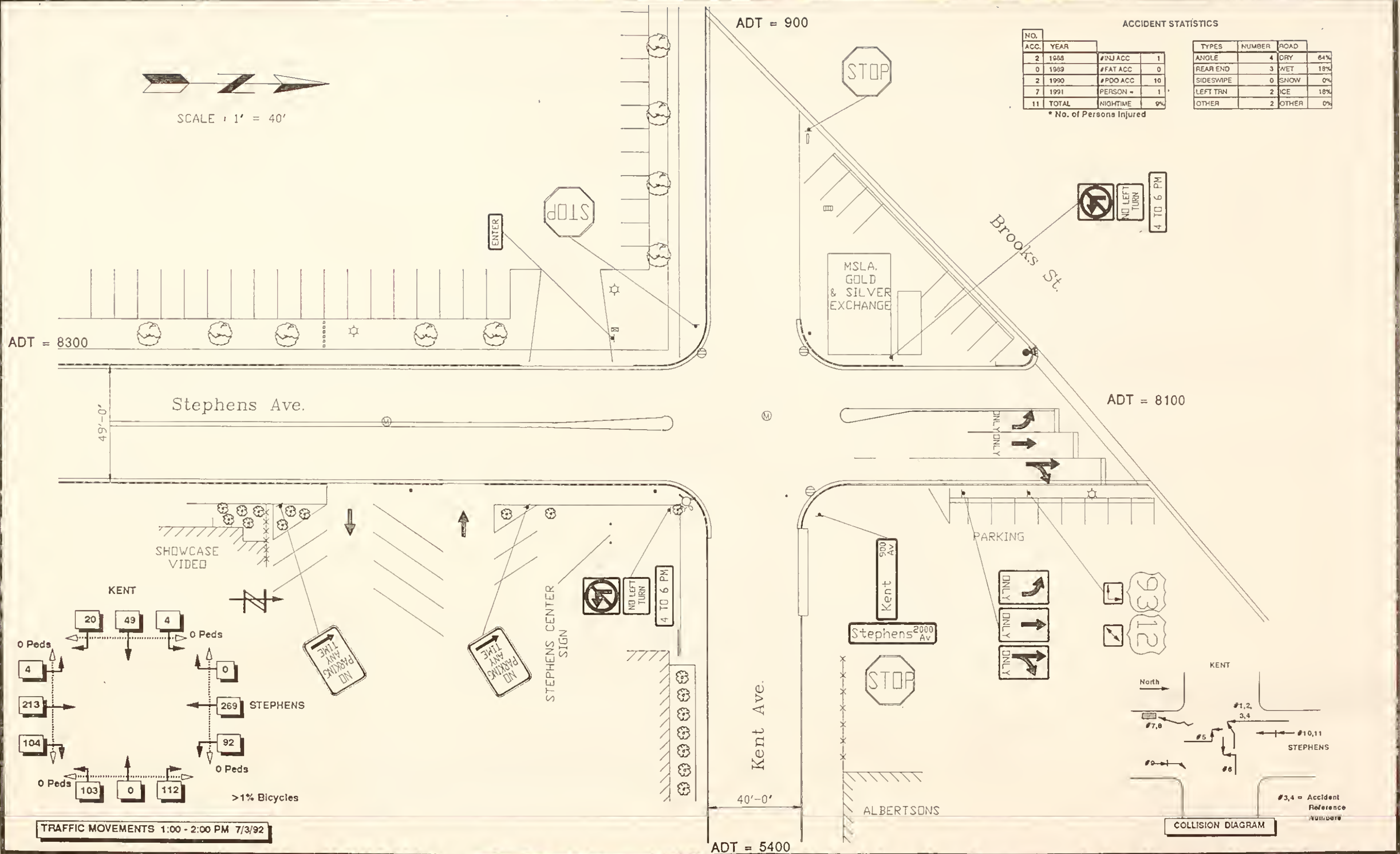
JOHNSON & FOURTEENTH

SHORT TERM IMPROVEMENTS

SHEET
38



SCALE : 1' = 40'



ACCIDENT STATISTICS			
NO.	ACC.	YEAR	
2	1988	#INJ ACC	1
0	1989	#FAT ACC	0
2	1990	#PDO ACC	10
7	1991	PERSON =	1
11	TOTAL	NIGHTTIME	9%

* No. of Persons Injured

TYPES	NUMBER	ROAD	
ANGLE	4	DRY	64%
REAR END	3	WET	18%
SIDESWIPE	0	SNOW	0%
LEFT TRN	2	ICE	18%
OTHER	2	OTHER	0%



MARVIN & ASSOCIATES

Traffic, Transportation & Civil Engineers

1127 Alderson Ave. #204
Billings, MT 59102

STEPHENS & KENT

EXISTING CONDITIONS

SHEET
39

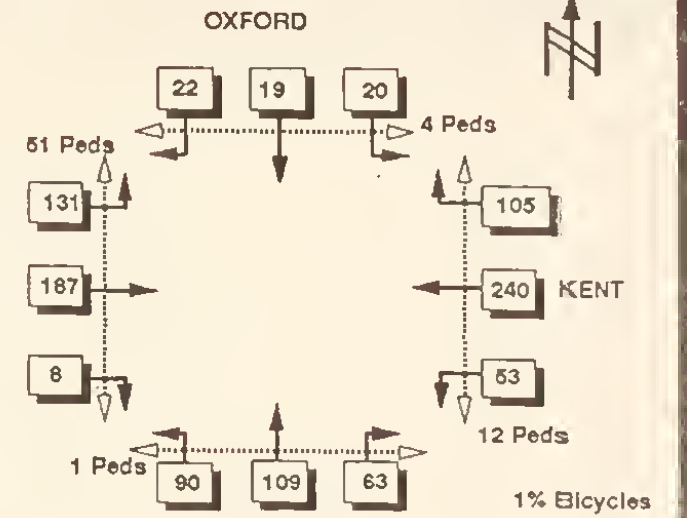
SCALE : 1" = 40'

ADT = 6000

Kent St.

Right Angle Parking

37'-0"
ADT = 3200



TRAFFIC MOVEMENTS 12:00 - 1:00 PM 7/3/92

ADT = 5900

37'-0"

ACCIDENT STATISTICS

NO. ACC.	YEAR		
1	1988	#INJ ACC	3
1	1989	#FAT ACC	0
4	1990	#PDO ACC	6
3	1991	PERSON =	3
9	TOTAL	NIGHTTIME	0%

* No. of Persons Injured

TYPES	NUMBER	ROAD	
ANGLE	4	DRY	78%
REAR END	3	WET	0%
SIDESWIPE	1	SNOW	0%
LEFT TRN	1	ICE	22%
OTHER	0	OTHER	0%

ADT = 3000

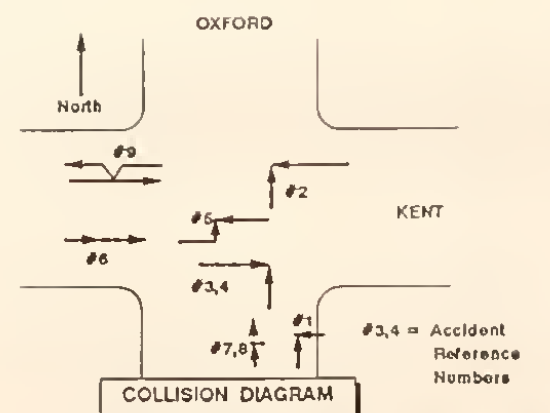
Oxford St.

Right Angle Parking

Kent



Oxford



MARVIN & ASSOCIATES

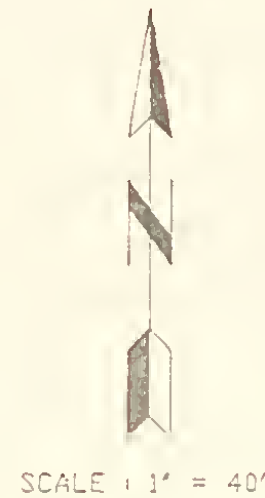
Traffic, Transportation & Civil Engineers

1127 Alderson Ave. #204
Billings, MT 59102

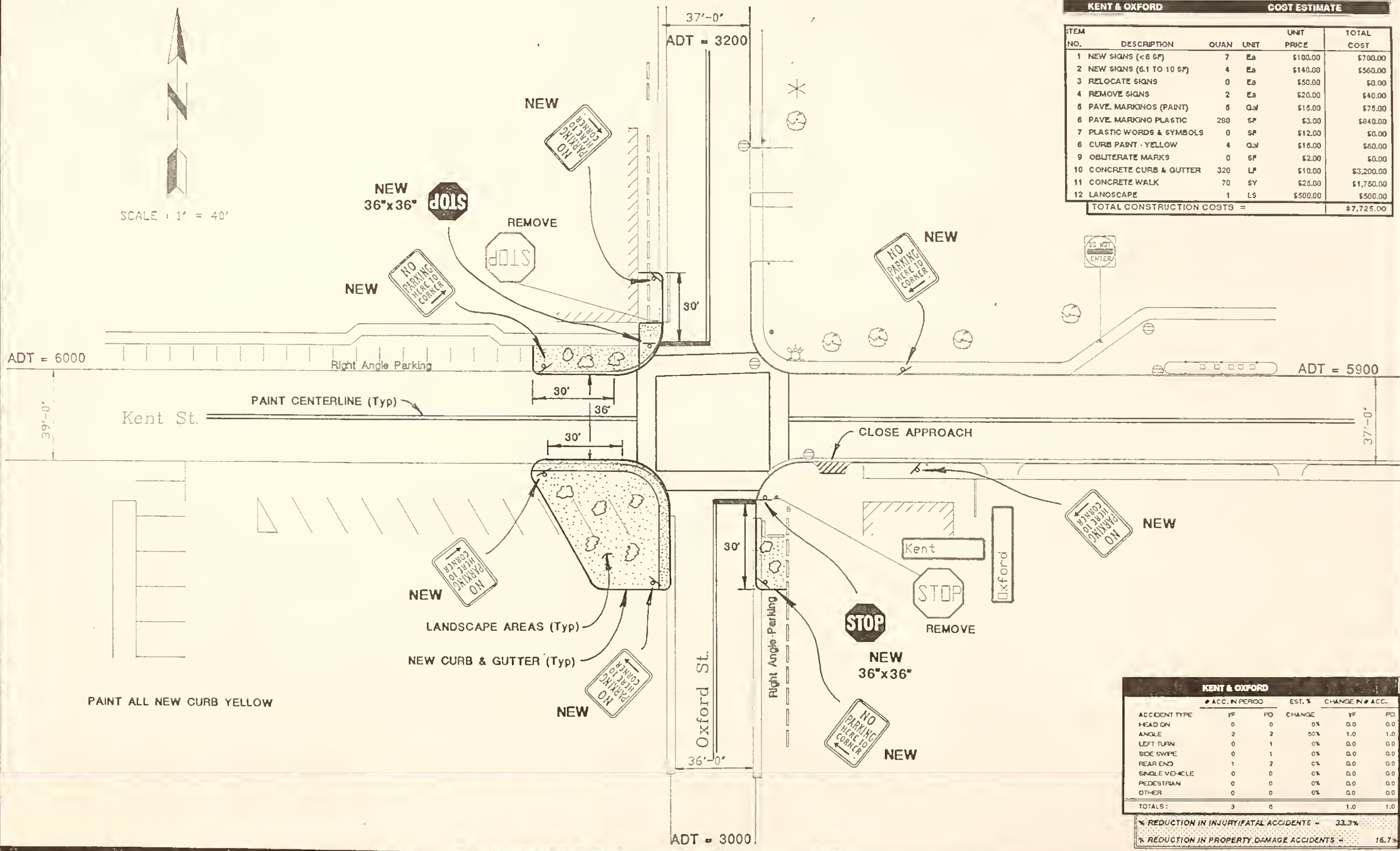
KENT & OXFORD

EXISTING CONDITIONS

SHEET
41



KENT & OXFORD				COST ESTIMATE	
ITEM NO.	DESCRIPTION	QUAN	UNIT	UNIT PRICE	TOTAL COST
1	NEW SIGNS (< 6 SF)	7	Ea	\$100.00	\$700.00
2	NEW SIGNS (6.1 TO 10 SF)	4	Ea	\$140.00	\$560.00
3	RELOCATE SIGNS	0	Ea	\$50.00	\$0.00
4	REMOVE SIGNS	2	Ea	\$20.00	\$40.00
5	PAVE MARKINGS (PAINT)	6	Qa	\$15.00	\$75.00
6	PAVE MARKING PLASTIC	280	SF	\$3.00	\$840.00
7	PLASTIC WORDS & SYMBOLS	0	SF	\$12.00	\$0.00
8	CURB PAINT - YELLOW	4	Qa	\$15.00	\$60.00
9	OBLITERATE MARKS	0	SF	\$2.00	\$0.00
10	CONCRETE CURB & GUTTER	320	LF	\$10.00	\$3,200.00
11	CONCRETE WALK	70	SF	\$25.00	\$1,750.00
12	LANDSCAPE	1	LS	\$500.00	\$500.00
TOTAL CONSTRUCTION COSTS =					\$7,725.00



KENT & OXFORD					
ACCIDENT TYPE	ACC. IN PERIOD		EST. % CHANGE	CHANGE IN ACC.	
	YF	PO		YF	PO
HEAD ON	0	0	0%	0.0	0.0
ANGLE	2	2	50%	1.0	1.0
LEFT TURN	0	1	0%	0.0	0.0
SIDE SWIPE	0	1	0%	0.0	0.0
REAR END	1	2	0%	0.0	0.0
SINGLE VEHICLE	0	0	0%	0.0	0.0
PEDESTRIAN	0	0	0%	0.0	0.0
OTHER	0	0	0%	0.0	0.0
TOTALS:	3	6		1.0	1.0
% REDUCTION IN INJURY/FATAL ACCIDENTS =				33.3%	
% REDUCTION IN PROPERTY DAMAGE ACCIDENTS =				16.7%	



MARVIN & ASSOCIATES
Traffic, Transportation & Civil Engineers

1127 Alderson Ave. #204
Billings, MT 59102

KENT & OXFORD

SHORT TERM IMPROVEMENTS

SHEET
42



ADT = 1400

MYRTLE ST.

37'

Paved Parking

Missoula Gospel Assembly

ALLEY

GARAGE

Paved Parking

ACCIDENT STATISTICS

NO. ACC.	YEAR		
2	1988	#INJ ACC	1
2	1989	#FAT ACC	0
0	1990	#PDO ACC	4
1	1991	PERSON =	1
5	TOTAL	NIGHTTIME	0%

* No. of Persons Injured

TYPES	NUMBER	ROAD	
ANGLE	4	DRY	100%
REAR END	0	WET	0%
SIDESWIPE	0	SNOW	0%
LEFT TRN	1	ICE	0%
OTHER	0	OTHER	0%



Clark Fork Christian Center

ALLEY

ADT = 2100

N100E

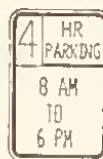
Ⓜ

FOURTH ST.

50'-0"

ADT = 1100

46'



Paved Parking



S. Fourth W.

Myrtle 600 St.

FOURTH ST

20 Peds

37

24

4

1 Peds

34

39

16

8 Peds

19

28

3

6 Peds

4

53

1

14% Bicycles

TRAFFIC MOVEMENTS 1:30 - 2:30 PM 8/3/92

ALLEY

Paved Parking

ADT = 1000

ALLEY

North

FOURTH

MYRTLE

COLLISION DIAGRAM

#3,4 = Accident Reference Numbers



MARVIN & ASSOCIATES

Traffic, Transportation & Civil Engineers

1127 Alderson Ave. #204
Billings, MT 59102

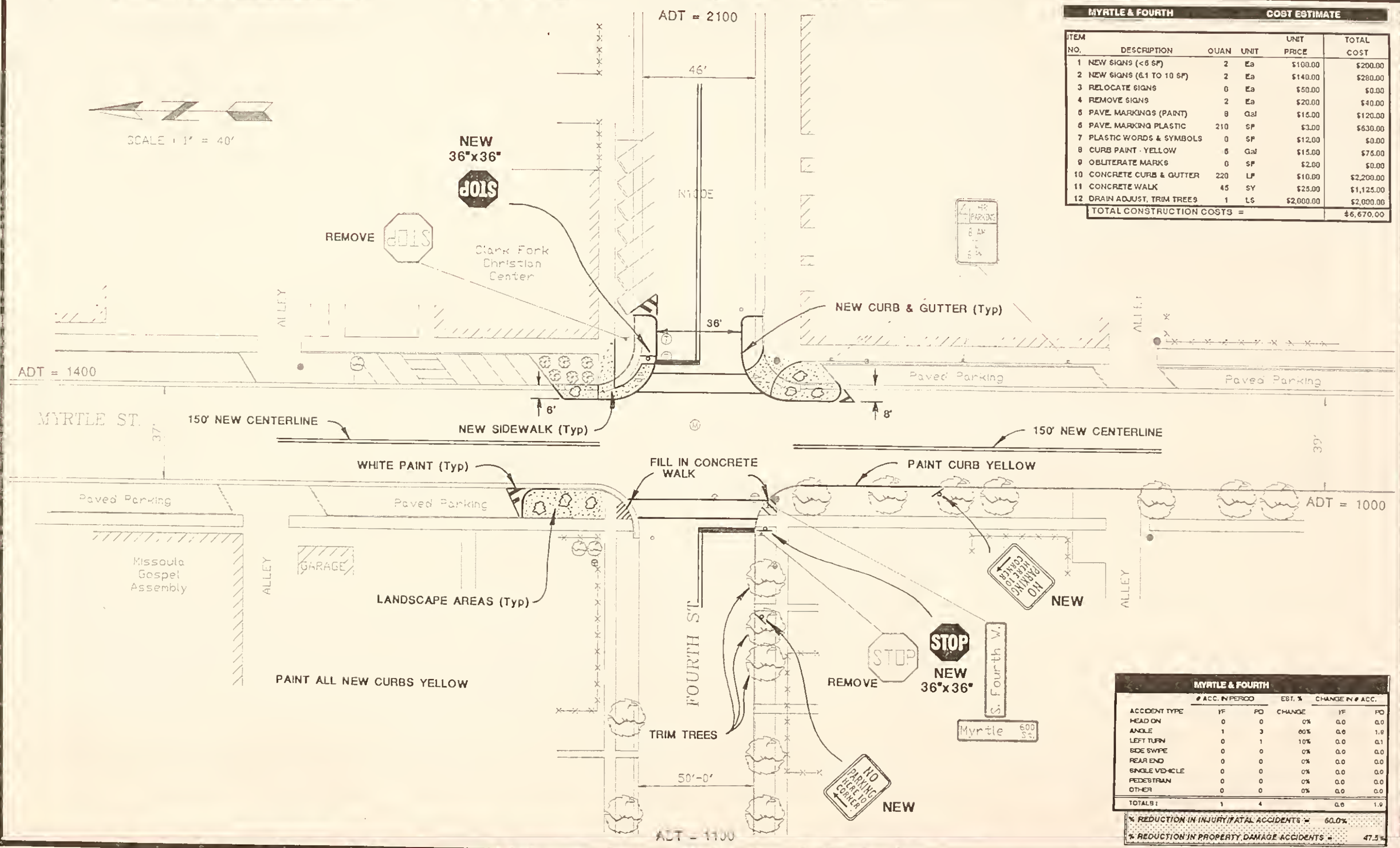
MYRTLE & FOURTH

EXISTING CONDITIONS

SHEET
43



SCALE: 1" = 40'



MYRTLE & FOURTH				COST ESTIMATE	
ITEM NO.	DESCRIPTION	QUAN	UNIT	UNIT PRICE	TOTAL COST
1	NEW SIGNS (<6 SF)	2	Ea	\$100.00	\$200.00
2	NEW SIGNS (6.1 TO 10 SF)	2	Ea	\$140.00	\$280.00
3	RELOCATE SIGNS	0	Ea	\$50.00	\$0.00
4	REMOVE SIGNS	2	Ea	\$20.00	\$40.00
5	PAVE MARKINGS (PAINT)	8	Gal	\$15.00	\$120.00
6	PAVE MARKING PLASTIC	210	SF	\$3.00	\$630.00
7	PLASTIC WORDS & SYMBOLS	0	SF	\$12.00	\$0.00
8	CURB PAINT - YELLOW	8	Gal	\$15.00	\$75.00
9	OBLITERATE MARKS	0	SF	\$2.00	\$0.00
10	CONCRETE CURB & GUTTER	220	LF	\$10.00	\$2,200.00
11	CONCRETE WALK	45	SY	\$25.00	\$1,125.00
12	DRAIN ADJUST, TRIM TREES	1	LS	\$2,000.00	\$2,000.00
TOTAL CONSTRUCTION COSTS =					\$6,670.00

MYRTLE & FOURTH					
ACCIDENT TYPE	# ACC. IN PERIOD		EST. % CHANGE	CHANGE IN # ACC.	
	YF	PD		YF	PD
HEAD ON	0	0	0%	0.0	0.0
ANGLE	1	3	60%	0.0	1.8
LEFT TURN	0	1	10%	0.0	0.1
SIDE SWIPE	0	0	0%	0.0	0.0
REAR END	0	0	0%	0.0	0.0
SINGLE VEHICLE	0	0	0%	0.0	0.0
PEDESTRIAN	0	0	0%	0.0	0.0
OTHER	0	0	0%	0.0	0.0
TOTALS:	1	4		0.0	1.9
% REDUCTION IN INJURY/FATAL ACCIDENTS =				60.0%	
% REDUCTION IN PROPERTY DAMAGE ACCIDENTS =				47.5%	

SCALE : 1" = 40'

ADT = 2600

Phillips St.

ACCIDENT STATISTICS

NO.	ACC.	YEAR		
2	1988	#INJ ACC	1	
0	1989	#FAT ACC	0	
2	1990	#PDO ACC	4	
1	1991	PERSON =	1	
5	TOTAL	NIGHTTIME	40%	

* No. of Persons Injured

TYPES	NUMBER	ROAD	
ANGLE	2	DRY	60%
REAR END	0	WET	20%
SIDESWIPE	0	SNOW	0%
LEFT TRN	0	ICE	20%
OTHER	3	OTHER	0%

30'-0" ADT = 200

6%

Vertical Curve

GARAGE

COWPER

0 Peds 2 74 3 0 Peds 4 2 0

1 Peds 2 52 PHILLIPS 0 4 Peds

3% Bicycles

TRAFFIC MOVEMENTS 8:00 - 9:00 AM 7/31/92

DRIVEWAY

37'-0"

ADT = 2500

Cowper St.

34'-0"

ADT = 250

HOUSE

Phillips St.

STOP

GARAGE

COWPER

North

PHILLIPS

#3,4 = Accident Reference Numbers

COLLISION DIAGRAM



MARVIN & ASSOCIATES

Traffic, Transportation & Civil Engineers

1127 Alderson Ave. #204
Billings, MT 59102

PHILLIPS & COWPER

EXISTING CONDITIONS

SHEET
45

SCALE: 1" = 40'

NEW
300' SOUTH

NEW

NEW
36"x36"

REMOVE

NEW

ADT = 2600

Phillips St.

PAINT CURBS YELLOW (Typ)

HOUSE

HOUSE

NEW

Cowper St.

ADT = 250

HOUSE

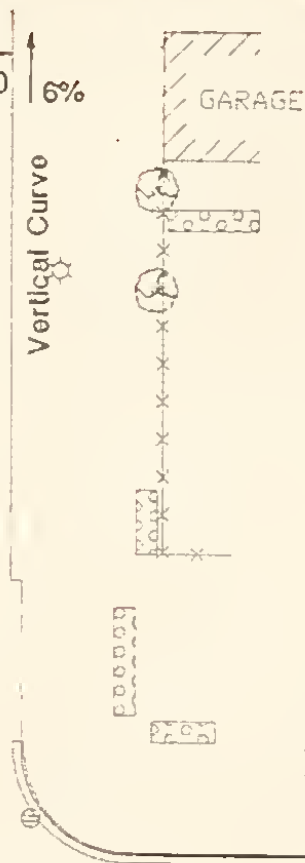
GARAGE

Phillips St.

REMOVE

STOP

NEW
36"x36"



NEW
NO PARKING
HERE TO
CORNER

RESTRIPE CENTERLINE 4" SOLID YELLOW

DRIVEWAY

ADT = 2500

PHILLIPS & COWPER

COST ESTIMATE

ITEM NO.	DESCRIPTION	QUAN	UNIT	UNIT PRICE	TOTAL COST
1	NEW SIGNS (< 6 SF)	7	Ea	\$100.00	\$700.00
2	NEW SIGNS (6.1 TO 10 SF)	2	Ea	\$140.00	\$280.00
3	RELOCATE SIGNS	0	Ea	\$50.00	\$0.00
4	REMOVE SIGNS	2	Ea	\$20.00	\$40.00
6	PAVE MARKINGS (PAINT)	7	Qd	\$15.00	\$105.00
6	PAVE MARKING PLASTIC	0	SF	\$3.00	\$0.00
7	PLASTIC WORDS & SYMBOLS	0	SF	\$12.00	\$0.00
8	CURB PAINT - YELLOW	6	Qd	\$15.00	\$75.00
9	OBLITERATE MARKS	0	SF	\$2.00	\$0.00
10	CONCRETE CURB & GUTTER	0	LF	\$10.00	\$0.00
11	CONCRETE WALK	0	SY	\$25.00	\$0.00
12	MISC	0	LS	\$100.00	\$0.00
TOTAL CONSTRUCTION COSTS =					\$1,200.00

PHILLIPS & COWPER

ACCIDENT TYPE	# ACC. IN PERIOD		EST. % CHANGE	CHANGE IN # ACC.	
	YF	PD		YF	PD
HEAD ON	0	0	0%	0.0	0.0
ANGLE	1	1	00%	0.0	0.0
LEFT TURN	0	0	0%	0.0	0.0
SOC SWIPE	0	0	0%	0.0	0.0
REAR END	0	0	0%	0.0	0.0
SINGLE VEHICLE	0	1	0%	0.0	0.0
PEDESTRIAN	0	0	0%	0.0	0.0
OTHER	1	1	10%	0.1	0.1
TOTALS:	2	3		0.7	0.7

% REDUCTION IN INJURY/FATAL ACCIDENTS = 35.0%

% REDUCTION IN PROPERTY DAMAGE ACCIDENTS = 23.3%



MARVIN & ASSOCIATES

Traffic, Transportation & Civil Engineers

1127 Alderson Ave. #204
Billings, MT 59102

PHILLIPS & COWPER

SHORT TERM IMPROVEMENTS

SHEET
46



SCALE : 1" = 40'

SIGNAL INFORMATION

Contractor - Triconex Model 390
Fully Actuated - Loops All Legs
Loops Set on Non-Lock
3 Loop Amplifiers
A Call & B Call Optimum
2 Ped Buttons Per Pole
Beckwith: Min G = 6 Amber = 5.0 All Red = 1.0
Arthur: Min G = 18 Amber = 5.0 All Red = 1.0
Phasing: #1 - Arthur Protect Lefts
#2 - Arthur Thru Rt & Perm Lt
#3 - Beckwith All Movements

SPEED
LIMIT
25

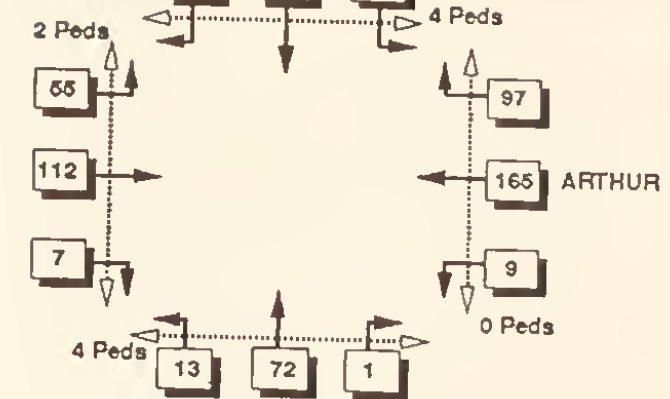
SPEED
LIMIT
25

NO
PARKING
ANY
TIME

ENTERING
RESIDENTIAL
PARKING DIST.
PERMIT REQUIRED
FOR
ON STREET PARKING
CONTACT
MISSOULA PARKING
COMMISSION
721-4700

8AM-5PM
MON-FRI
EXCEPT
HOLIDAYS

BECKWITH



TRAFFIC MOVEMENTS 8:00 - 9:00 AM 8/4/92

ADT = 8900

Arthur St.

ADT = 9400

ADT = 6800

ADT = 3100

NO.	ACC.	YEAR		
2	1988	#INJ ACC	3	
1	1989	#FAT ACC	0	
3	1990	#PDO ACC	5	
2	1991	PERSON =	4	
6	TOTAL	MO/MTIME	13%	

* No. of Persons Injured

ACCIDENT STATISTICS

TYPES	NUMBER	ROAD	
ANGLE	2	DRY	75%
REAR END	3	WET	13%
SIDESWIPE	0	SNOW	0%
LEFT TRN	2	ICE	13%
OTHER	1	OTHER	0%

8AM-5PM
MON-FRI
EXCEPT
HOLIDAYS

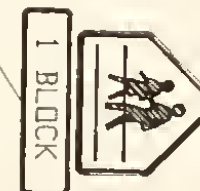
ENTERING
RESIDENTIAL
PARKING DIST.
PERMIT REQUIRED
FOR
ON STREET PARKING
CONTACT
MISSOULA PARKING
COMMISSION
721-4700

RESIDENTIAL
PARKING
PERMIT
REQUIRED

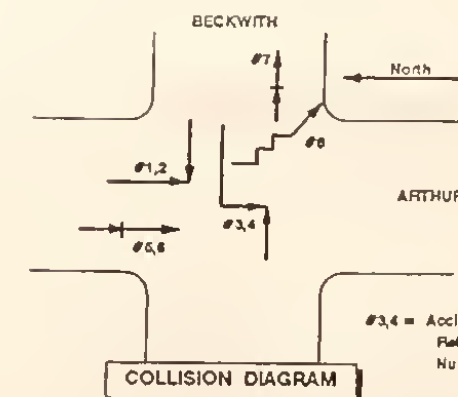
Controller

St. Name Signs (Typ)

HOUSE



SPEED
LIMIT
30



COLLISION DIAGRAM

#3,4 = Accident
Reference
Numbers



MARVIN & ASSOCIATES

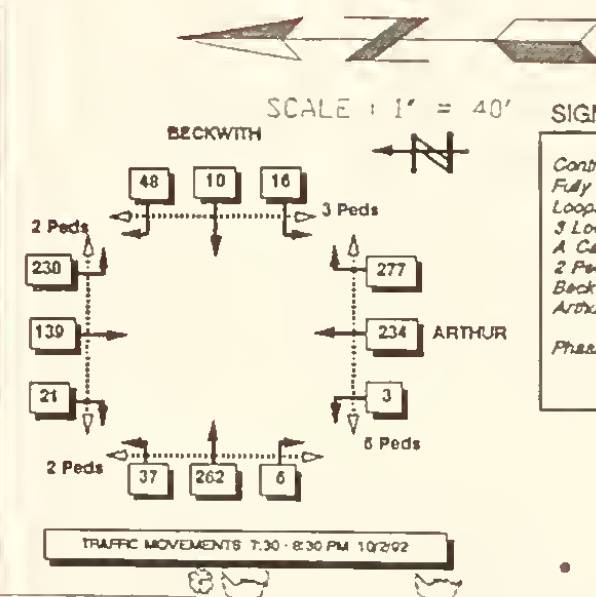
Traffic, Transportation & Civil Engineers

1127 Alderson Ave. #204
Billings, MT 59102

ARTHUR & BECKWITH

EXISTING CONDITIONS

SHEET
47



SCALE: 1" = 40'

SIGNAL INFORMATION

Controller - Transcon Model 390
Fully Actuated - Loops All Legs
Loops Set on Non-Lock
3 Loop Amplifiers
A Call & B Call Opticom
2 Ped Buttons Per Pole
Beckwith: Min G = 8 Arthur = 3.0 All Red = 1.0
Arthur: Min G = 18 Arthur = 3.0 All Red = 1.0
Phasing: #1 - Arthur Protect Lefts
#2 - Arthur Thru Rt & Perm. Lt
#3 - Beckwith All Movements

ADT = 8900

Arthur St.

EXTEND STOP BARS (TYP.)

ADT = 6800

New Pole w/25' Mast Arm
Add 1 New Signal Head
Adjust Inlet Location & Elev.

NEW LOOP DETECTORS

ENTERING RESIDENTIAL PARKING DIST. PERMIT REQUIRED FOR ON STREET PARKING CONTACT MISSOULA PARKING COMMISSION 721-4700

8AM-5PM MON-FRI EXCEPT HOLIDAYS

WIDEN ROADWAY 12' & CONSTRUCT NEW RIGHT TURN LANE AS SHOWN

ADT = 9400

St. Name Signs (Typ)
MOVE STREET NAME SIGNS 3' FROM POLE FACE

PAINT CURB YELLOW

NEW LOOP DETECTORS

TRIM LOW BRANCHES TO IMPROVE SIGNAL VISIBILITY

CONVERT APP. FOR LT. TURN BAY PLASTIC MARKINGS (TYP.)

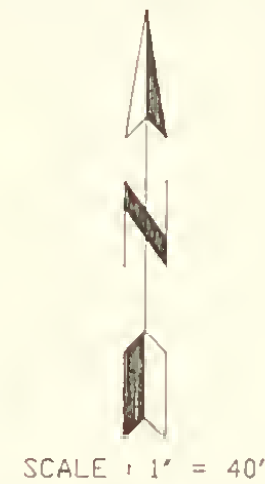
SIGNAL MODIFICATIONS

INCREASE AMBER TO 3.5 SECONDS.
INCREASE PASSAGE TIME EXTENSION BY 0.5 SECONDS.
REPLACE 12"-8" SIGNAL HEADS ON MASTS WITH ALL 12" HEADS (6 TOTAL)
WIRE NEW POLE & SIGNAL HEADS TO CONTROLLER
INSTALL NEW LOOP DETECTORS & LEADS TO CONTROLLER

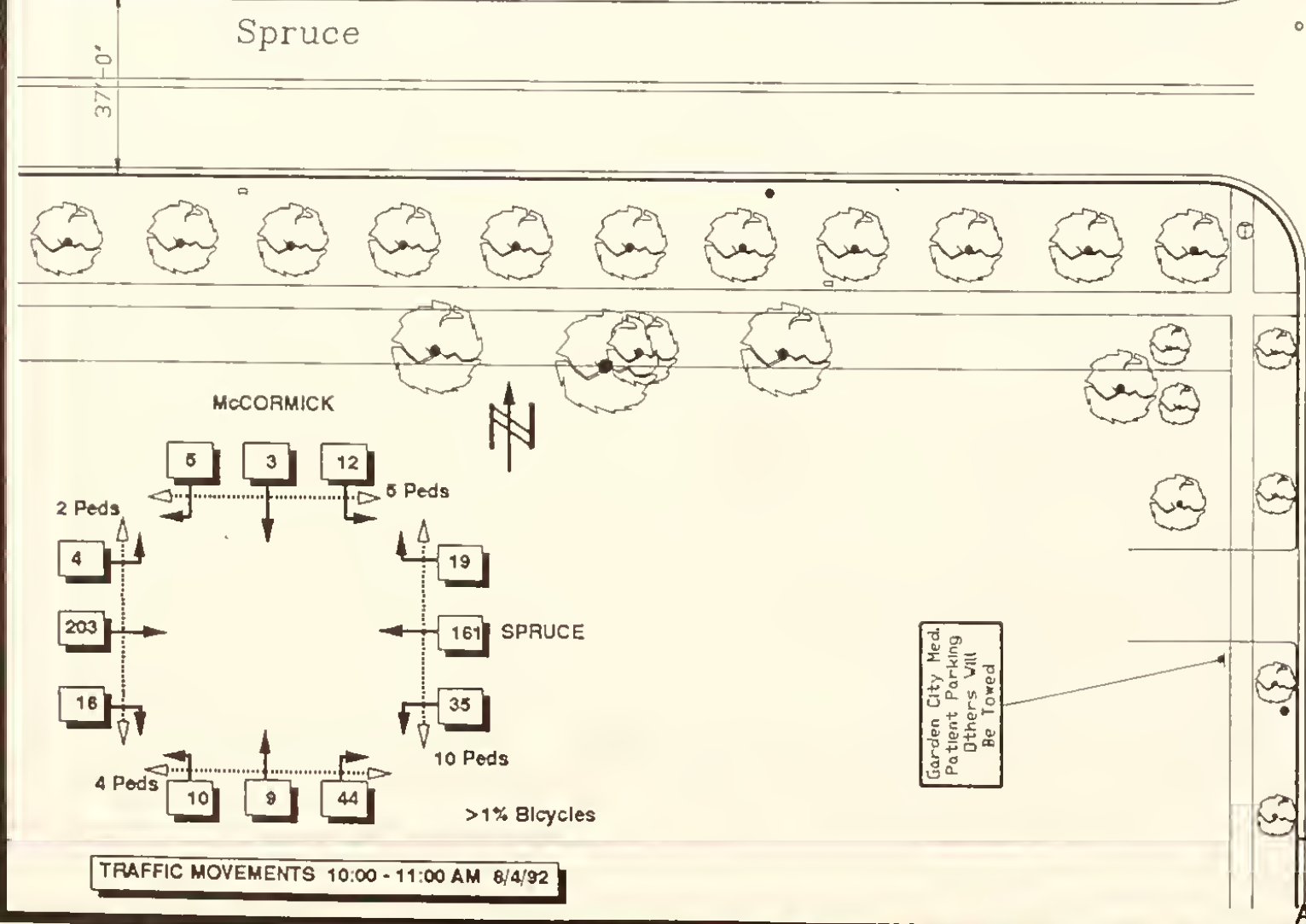
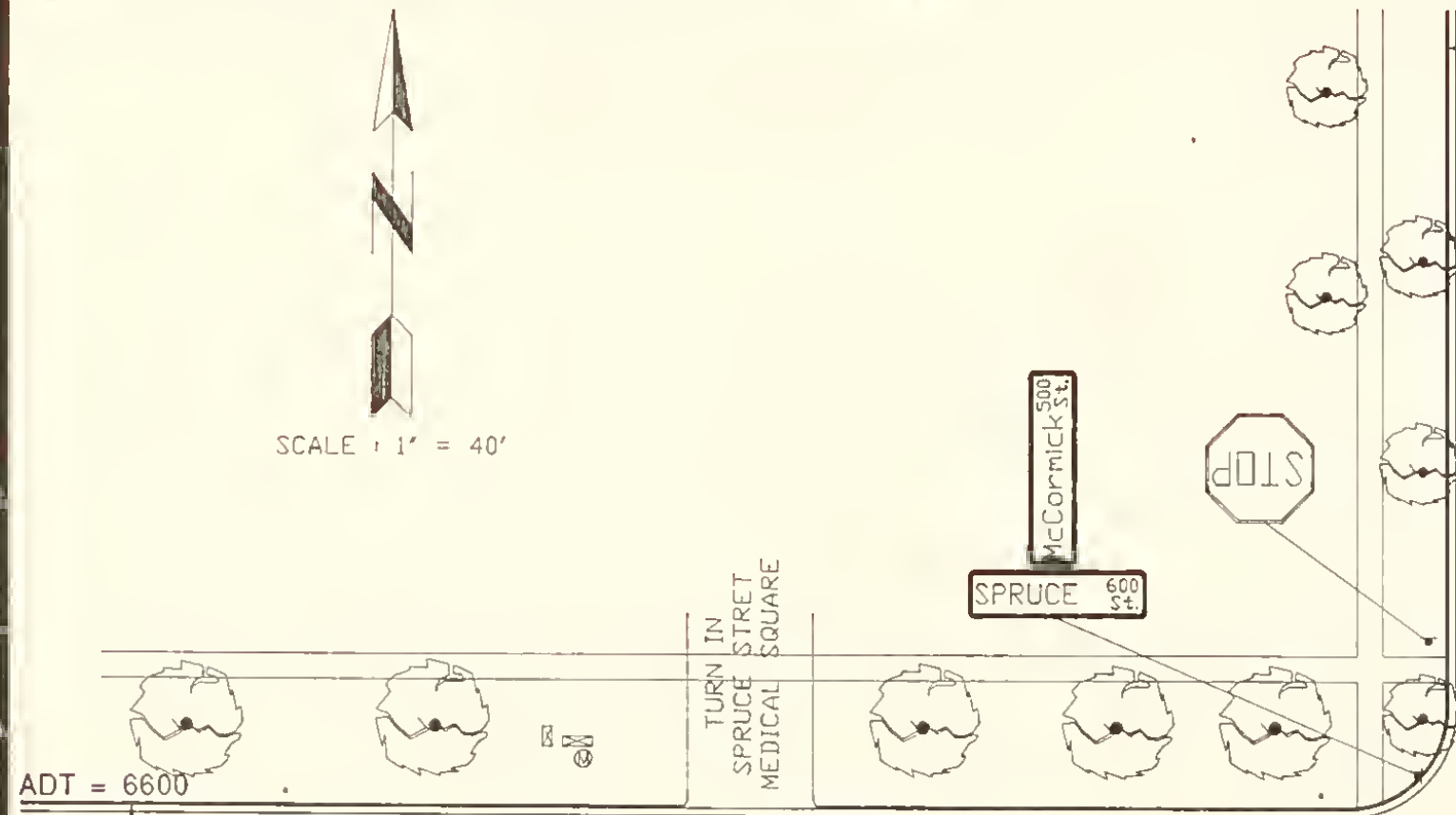
ARTHUR & BECKWITH COST ESTIMATE

ITEM NO.	DESCRIPTION	QUAN	UNIT	UNIT PRICE	TOTAL COST
1	NEW SIGNS (<6 SF)	4	EA	\$100.00	\$400.00
2	NEW SIGNS (6.1 TO 10 SF)	6	EA	\$140.00	\$700.00
3	RELOCATE SIGNS	4	EA	\$50.00	\$200.00
4	REMOVE SIGNS	0	EA	\$20.00	\$0.00
5	PAVE MARKINGS (PAINT)	4	QAL	\$15.00	\$60.00
6	PAVE MARKING PLASTIC	250	SF	\$3.00	\$750.00
7	PLASTIC WORDS & SYMBOLS	80	SF	\$12.00	\$960.00
8	CURB PAINT - YELLOW	8	QAL	\$15.00	\$120.00
9	NEW SIGNAL HEADS	7	EA	\$400.00	\$2,800.00
10	CUT & TRIM TREES	1	LS	\$1,000.00	\$1,000.00
11	NEW POLE & SIGNAL MOD	1	LS	\$6,000.00	\$6,000.00
12	CURB, PAVING & MISC	1	LS	\$9,000.00	\$9,000.00
TOTAL CONSTRUCTION COSTS =					\$21,990.00

ACCIDENT TYPE	# ACC. IN PERIOD		EST. % CHANGE	CHANGE IN # ACC.	
	IF	PD		IF	PD
HEAD ON	0	0	0%	0.0	0.0
ANGLE	1	1	70%	0.7	0.7
LEFT TURN	1	1	50%	0.5	0.5
SIDE SWIPE	0	0	0%	0.0	0.0
REAR END	1	2	20%	0.2	0.4
SINGLE VEHICLE	0	1	0%	0.0	0.0
PEDESTRIAN	0	0	0%	0.0	0.0
OTHER	0	0	0%	0.0	0.0
TOTALS:	3	5		1.4	1.6
% REDUCTION IN INJURY/FATAL ACCIDENTS = 45.7%					
% REDUCTION IN PROPERTY DAMAGE ACCIDENTS = 32.0%					



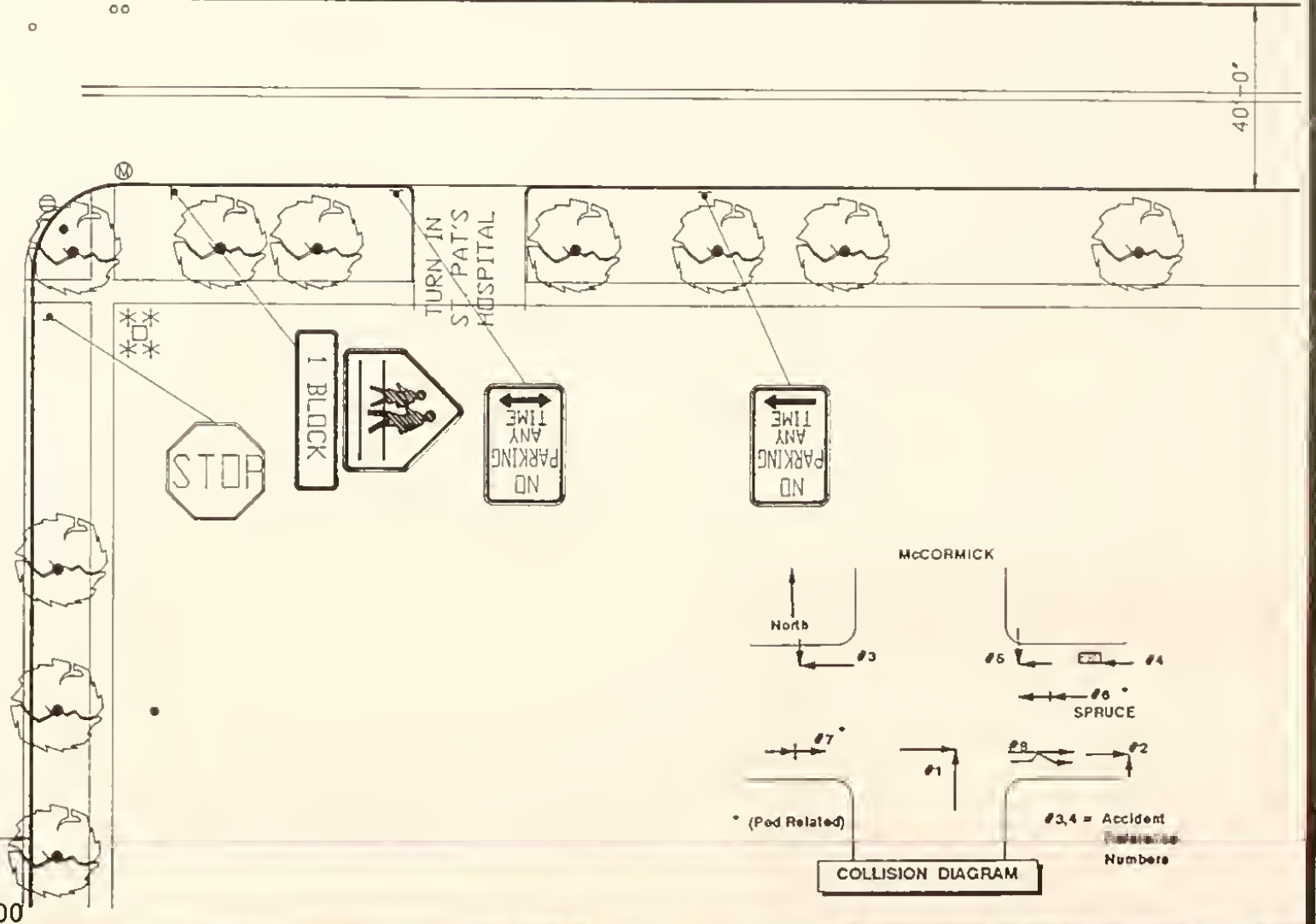
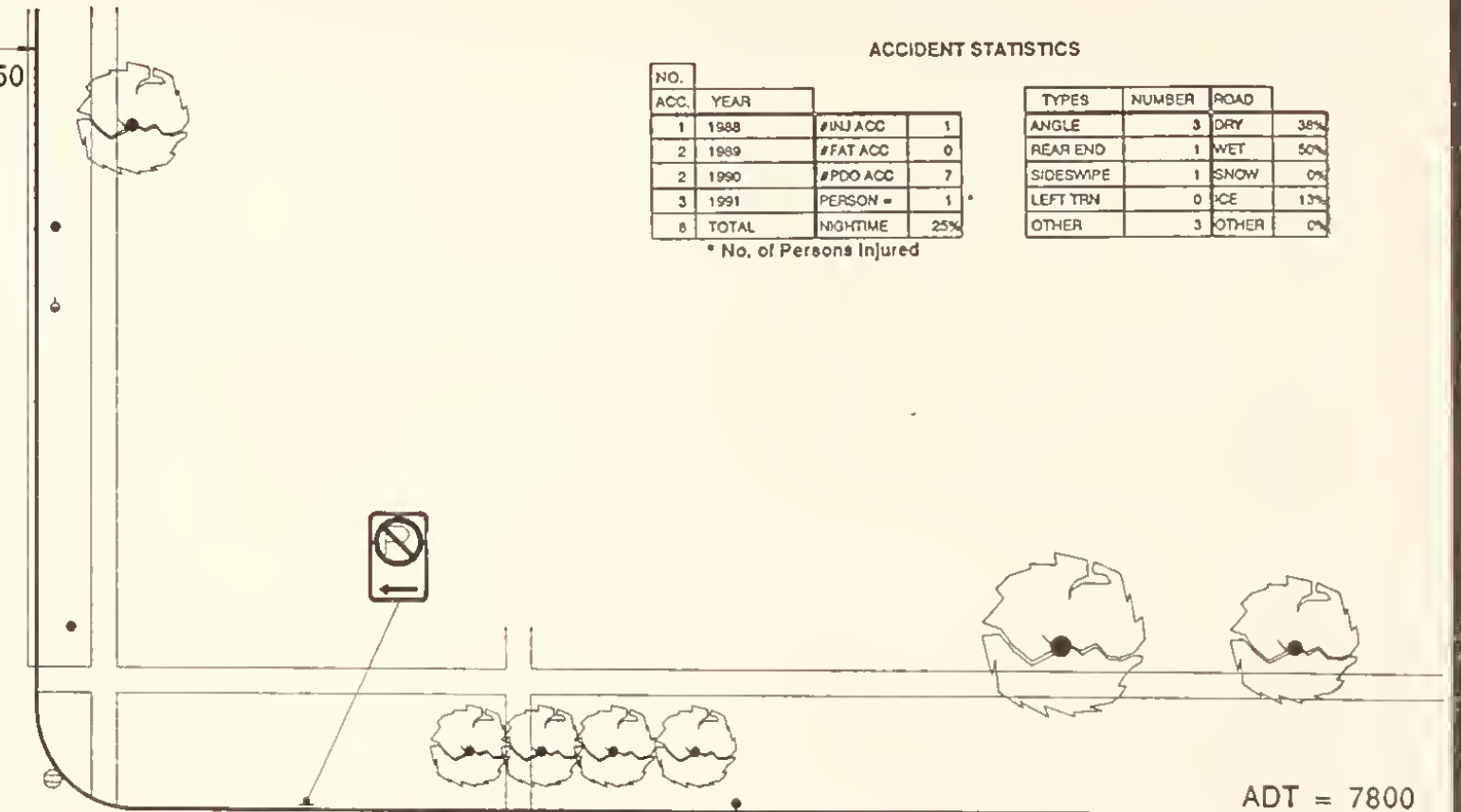
SCALE : 1" = 40'



ACCIDENT STATISTICS			
NO.	ACC.	YEAR	
1	1988	#UNJ ACC	1
2	1989	#FAT ACC	0
2	1990	#PDO ACC	7
3	1991	PERSON =	1
6	TOTAL	NIGHTIME	25%

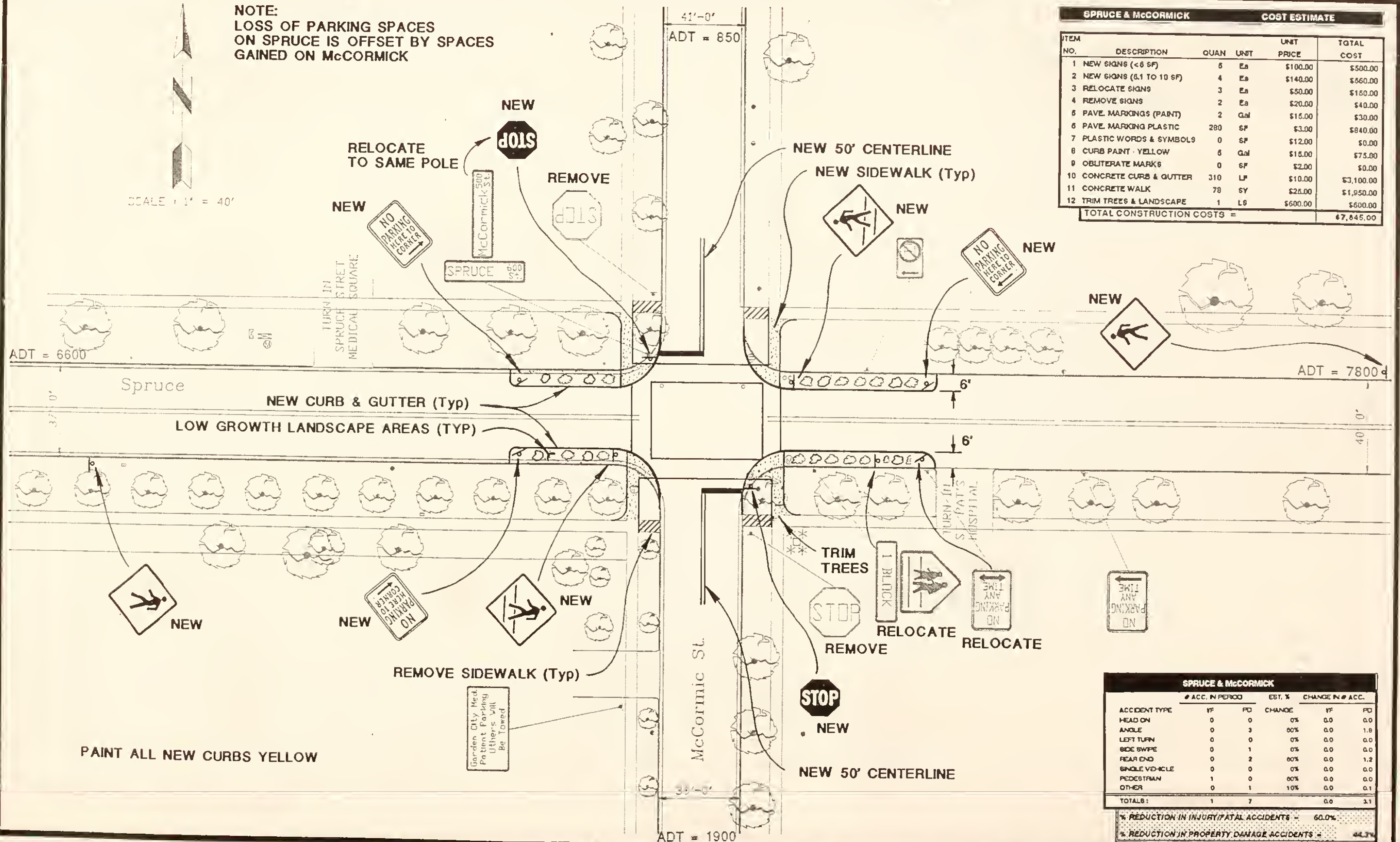
* No. of Persons Injured

TYPES	NUMBER	ROAD	
ANGLE	3	DRY	38%
REAR END	1	WET	50%
SIDESWIPE	1	SNOW	0%
LEFT TRN	0	ICE	13%
OTHER	3	OTHER	0%



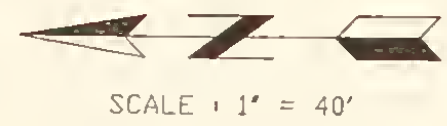
NOTE:
LOSS OF PARKING SPACES
ON SPRUCE IS OFFSET BY SPACES
GAINED ON McCORMICK

SCALE 1" = 40'



SPRUCE & McCORMICK				COST ESTIMATE	
ITEM NO.	DESCRIPTION	QUAN	UNIT	UNIT PRICE	TOTAL COST
1	NEW SIGNS (<6 SF)	5	Ea	\$100.00	\$500.00
2	NEW SIGNS (6.1 TO 10 SF)	4	Ea	\$140.00	\$560.00
3	RELOCATE SIGNS	3	Ea	\$50.00	\$150.00
4	REMOVE SIGNS	2	Ea	\$20.00	\$40.00
5	PAVE MARKINGS (PAINT)	2	Gal	\$15.00	\$30.00
6	PAVE MARKING PLASTIC	280	SF	\$3.00	\$840.00
7	PLASTIC WORDS & SYMBOLS	0	SF	\$12.00	\$0.00
8	CURB PAINT - YELLOW	5	Gal	\$15.00	\$75.00
9	OBTERATE MARKS	0	SF	\$2.00	\$0.00
10	CONCRETE CURB & GUTTER	310	LF	\$10.00	\$3,100.00
11	CONCRETE WALK	78	SY	\$25.00	\$1,950.00
12	TRIM TREES & LANDSCAPE	1	LS	\$600.00	\$600.00
TOTAL CONSTRUCTION COSTS =					\$7,845.00

SPRUCE & McCORMICK					
ACCIDENT TYPE	# ACC. IN PERIOD		EST. % CHANGE	CHANGE IN # ACC.	
	YF	PD		YF	PD
HEAD ON	0	0	0%	0.0	0.0
ANGLE	0	3	60%	0.0	1.8
LEFT TURN	0	0	0%	0.0	0.0
SIDE SWIPE	0	1	0%	0.0	0.0
REAR END	0	2	60%	0.0	1.2
SINGLE VEHICLE	0	0	0%	0.0	0.0
PEDESTRIAN	1	0	60%	0.0	0.0
OTHER	0	1	10%	0.0	0.1
TOTALS:	1	7		0.0	3.1
% REDUCTION IN INJURY/FATAL ACCIDENTS = 60.0%					
% REDUCTION IN PROPERTY DAMAGE ACCIDENTS = 44.3%					

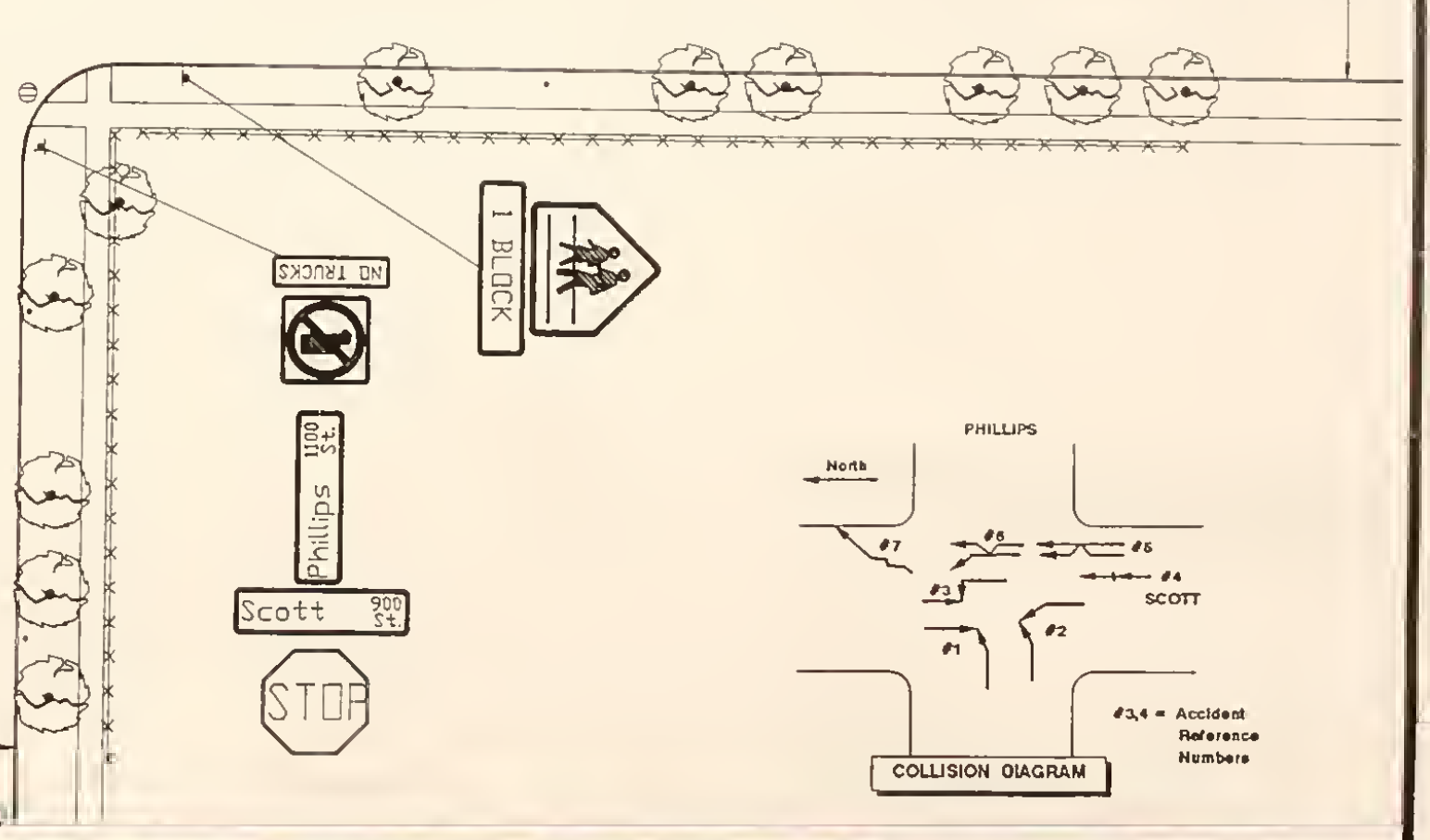
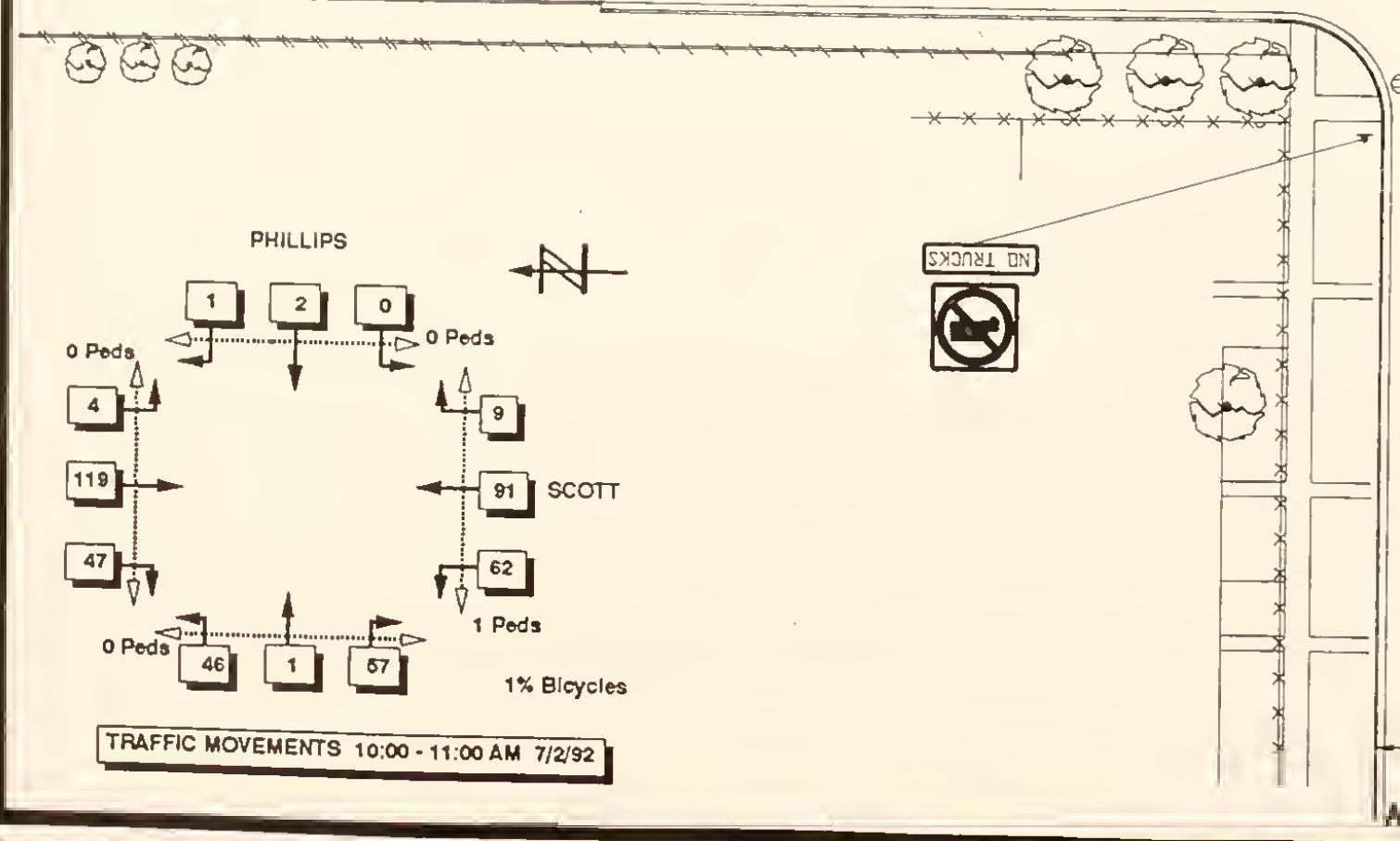
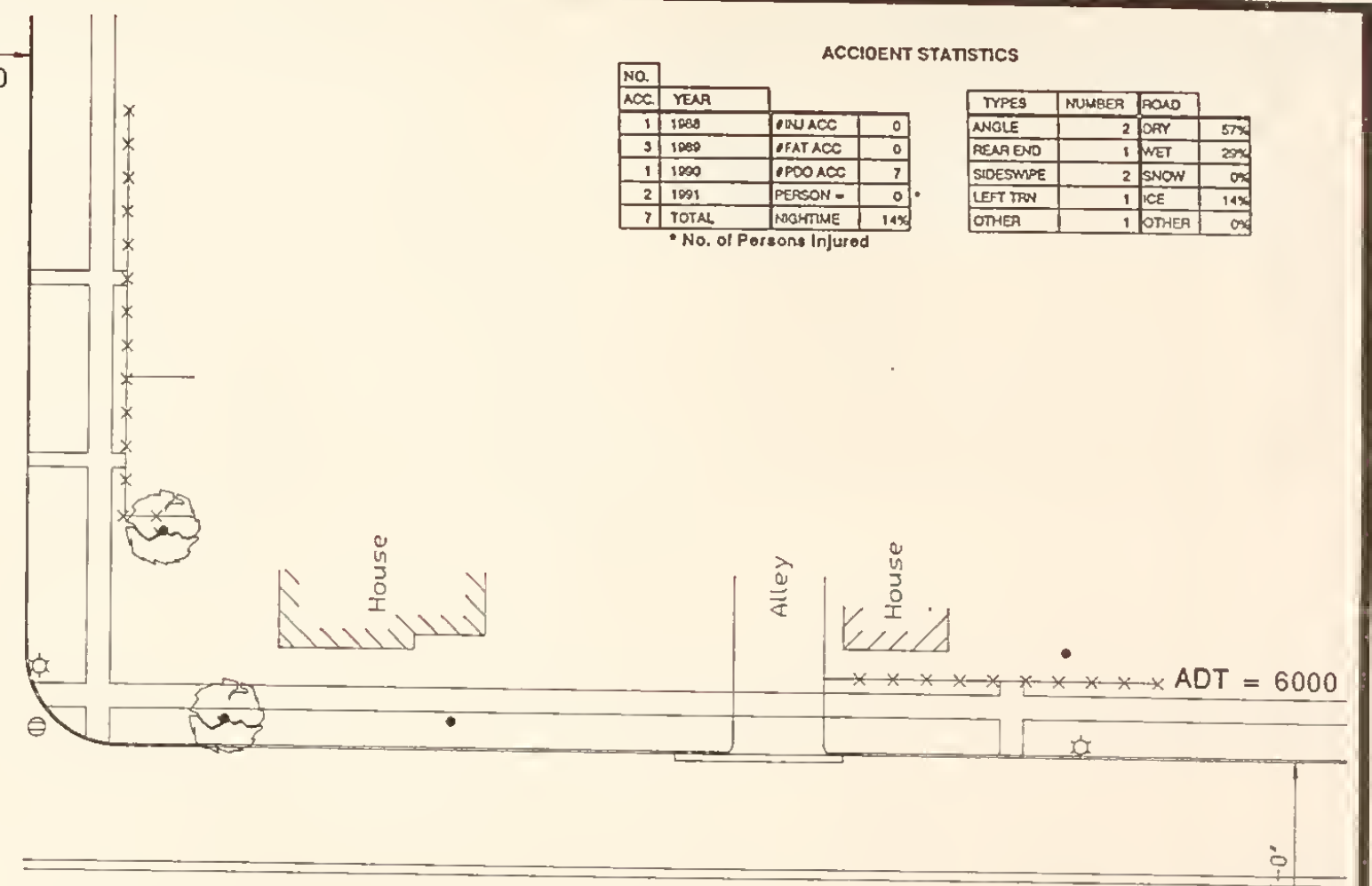
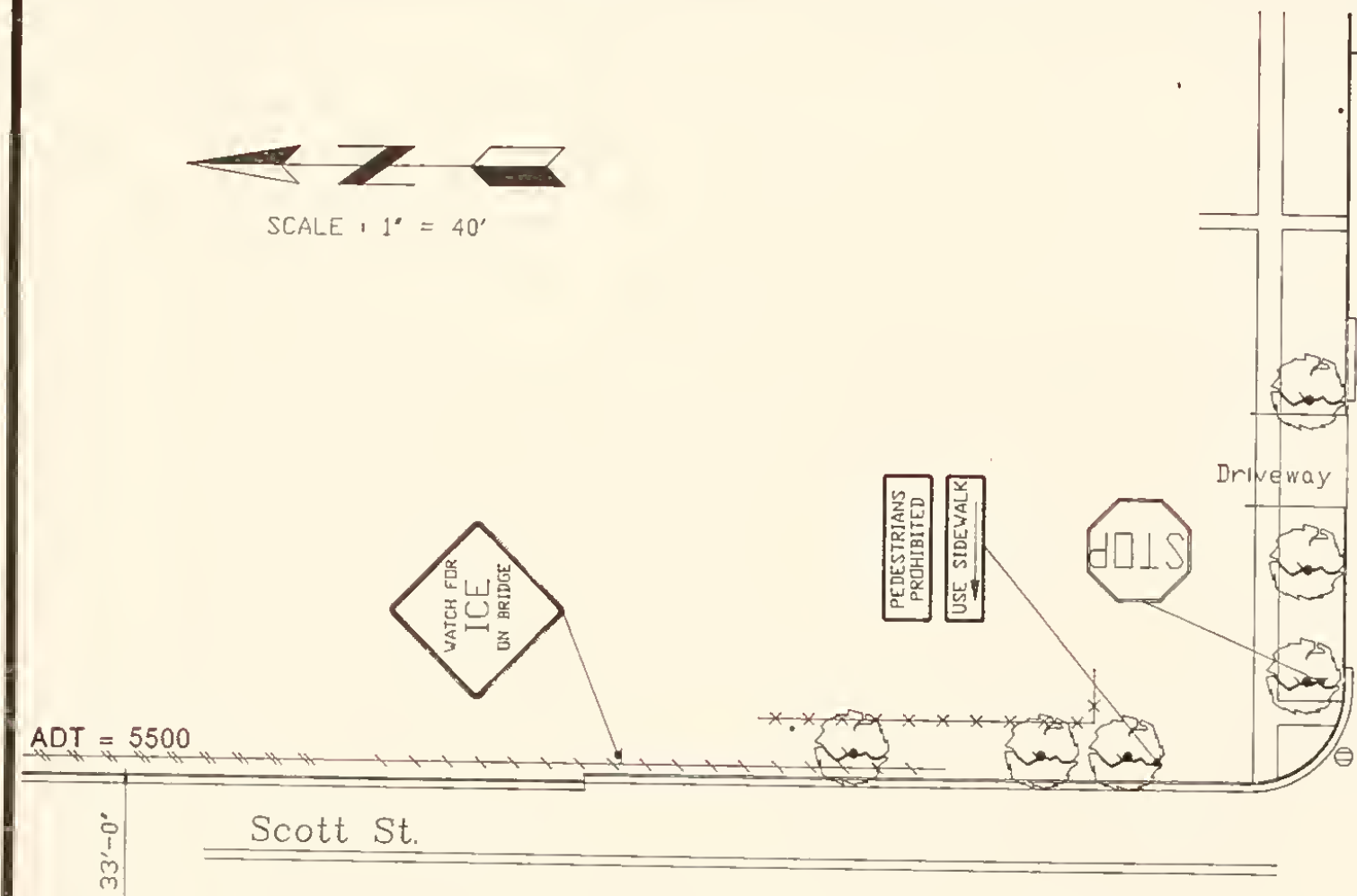


ACCIDENT STATISTICS

NO.	ACC.	YEAR		
1	1988	#INJ ACC	0	
3	1989	#FAT ACC	0	
1	1990	#POD ACC	7	
2	1991	PERSON =	0	
7	TOTAL	NIGHTTIME	14%	

* No. of Persons Injured

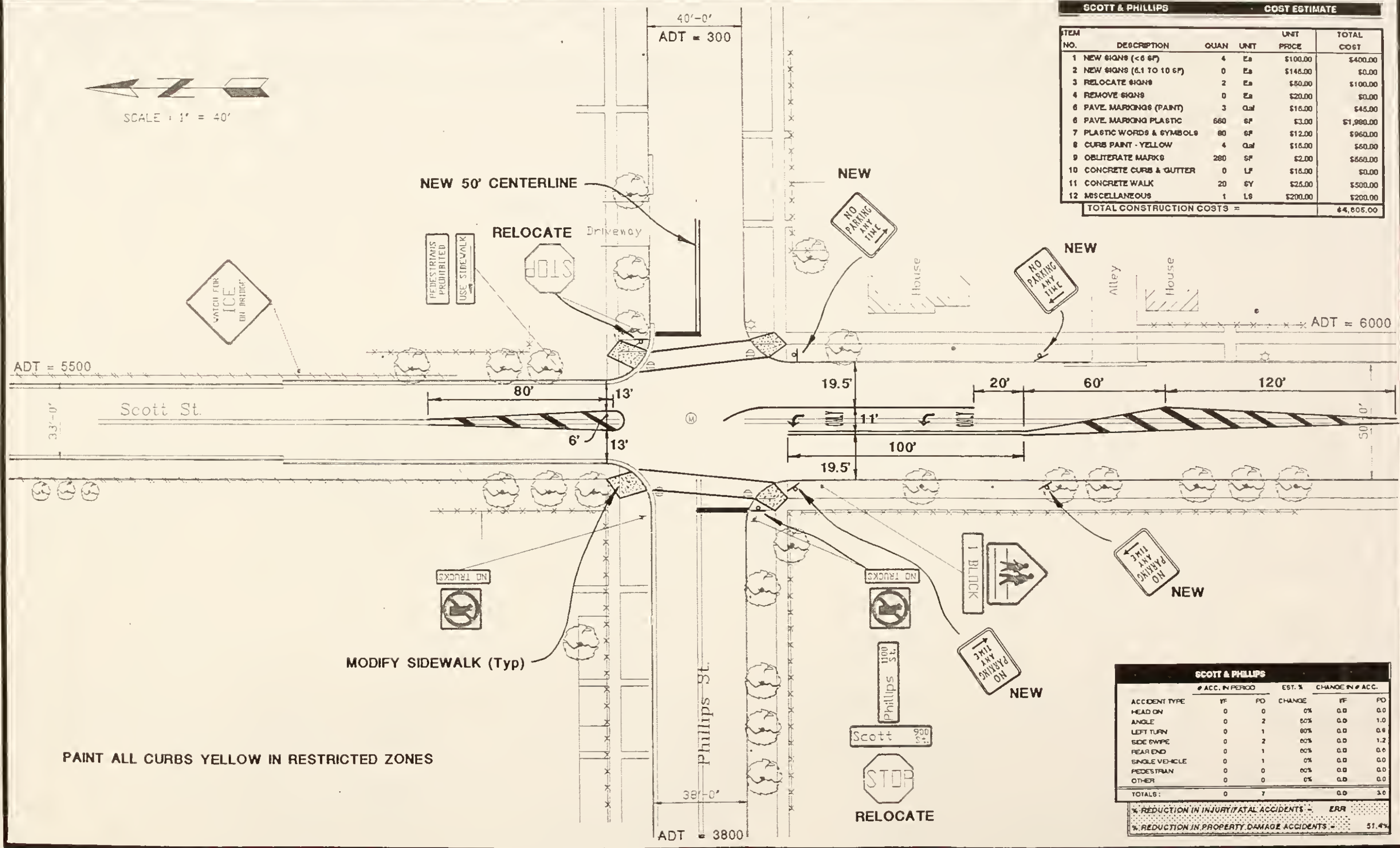
TYPES	NUMBER	ROAD	
ANGLE	2	DRY	57%
REAR END	1	WET	29%
SIDESWIPE	2	SNOW	0%
LEFT TRN	1	ICE	14%
OTHER	1	OTHER	0%





SCOTT & PHILLIPS COST ESTIMATE

ITEM NO.	DESCRIPTION	QUAN	UNIT	PRICE	TOTAL COST
1	NEW SIGNS (<6 SF)	4	Ea	\$100.00	\$400.00
2	NEW SIGNS (6.1 TO 10 SF)	0	Ea	\$145.00	\$0.00
3	RELOCATE SIGNS	2	Ea	\$50.00	\$100.00
4	REMOVE SIGNS	0	Ea	\$20.00	\$0.00
6	PAVE MARKINGS (PAINT)	3	Clf	\$15.00	\$45.00
6	PAVE MARKING PLASTIC	660	SF	\$3.00	\$1,980.00
7	PLASTIC WORDS & SYMBOLS	80	SF	\$12.00	\$960.00
8	CURB PAINT - YELLOW	4	Clf	\$15.00	\$60.00
9	OBTERATE MARKS	280	SF	\$2.00	\$560.00
10	CONCRETE CURB & GUTTER	0	LF	\$15.00	\$0.00
11	CONCRETE WALK	20	SY	\$25.00	\$500.00
12	MISCELLANEOUS	1	LS	\$200.00	\$200.00
TOTAL CONSTRUCTION COSTS =					\$4,605.00



SCOTT & PHILLIPS

ACCIDENT TYPE	# ACC. IN PERIOD		EST. % CHANGE	CHANGE IN # ACC.	
	VF	PO		VF	PO
HEAD ON	0	0	0%	0.0	0.0
ANGLE	0	2	50%	0.0	1.0
LEFT TURN	0	1	60%	0.0	0.6
SIDE SWIPE	0	2	60%	0.0	1.2
REAR END	0	1	60%	0.0	0.6
SINGLE VEHICLE	0	1	0%	0.0	0.0
PEDESTRIAN	0	0	60%	0.0	0.0
OTHER	0	0	0%	0.0	0.0
TOTALS:	0	7		0.0	3.0

% REDUCTION IN INJURY/TOTAL ACCIDENTS - ERR

% REDUCTION IN PROPERTY DAMAGE ACCIDENTS - 51.4%

